

# **8LS three-phase synchronous motors**

## **User's manual**

Version: **2.0 (2016-04-29)**

Model no.: **MAMOT2-ENG**

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# 1 General information

## Document versions

Version	Date	Notes	Author
2.0	2016-04-29	First edition for motor version V3	Docu 1

## 1.1 About this manual

This user's manual describes all B&R motors that begin with the order codes 8LSA... and 8LSC... and provides information regarding their use – from delivery to disposal.

Read this user's manual before you begin using the respective motor. This will ensure safe operation, help prevent errors and maximize the service life of the motor.

B&R does its best to continuously improve the quality of information in this manual. If you notice any errors or have suggestions for improvement, please contact B&R Support.

Be sure to observe the safety notices provided in this manual at all times.

## 1.2 Safety guidelines

### 1.2.1 Organization of safety notices

Safety notices in this manual are organized as follows:

Safety notice	Description
<b>Danger!</b>	Disregarding these safety guidelines and notices can be life-threatening.
<b>Warning!</b>	Disregarding these safety guidelines and notices can result in severe injury or substantial damage to equipment.
<b>Caution!</b>	Disregarding these safety guidelines and notices can result in injury or damage to equipment.
<b>Note:</b>	This information is important for preventing errors.

Table 1: Organization of safety notices

### 1.2.2 Intended use

Servo drives are components designed to be installed in electrical systems or machines. They are not permitted to be used unless the machine meets directive 2006/42/EC (machinery directive) as well as directive 2004/108/EC (EMC directive).

Servo motors are only permitted to be used with servo drives that are operated on grounded, three-phase industrial mains (TN, TT power mains). When used in residential areas, commercial areas or small businesses, additional filtering measures must be implemented by the user.

Technical data as well as connection and environmental specifications can be found on the type plate and in this user's manual. Specifications regarding connection and environmental conditions must be observed!

### **Danger!**

**The servo motors described in this manual are not permitted for use in potentially explosive areas unless explicitly designed and labeled accordingly.**

In special cases – use in non-commercial installations – with additional requirements (e.g. protection of children's fingers), these requirements must be fulfilled by the user on the system side.

The motors in this manual are designed for indoor operation under the controlled climate conditions typically found in a production hall.

### 1.2.3 General safety guidelines

B&R servo drives and servo motors have been designed, developed and manufactured for conventional use in industrial environments. They were not designed, developed and manufactured for any use involving serious risks or hazards that could lead to death, injury, serious physical damage or loss of any kind without the implementation of exceptionally stringent safety precautions.

In particular, such risks and hazards include the use of these devices to monitor nuclear reactions in nuclear power plants, their use in flight control or flight safety systems as well as in the control of mass transportation systems, medical life support systems or weapons systems.

This servo motor has been constructed in accordance with the current standards of safety technology and tested for operational safety prior to delivery.

To ensure proper installation and safe operation, be sure to read and observe:

- The installation and maintenance guidelines provided in this manual and any accompanying documentation
- The accompanying safety and installation guidelines
- The technical documentation for the respective product
- The installation and safety guidelines for the ACOPOS drive being used
- National, local and plant-specific regulations for your end product

The following dangers must be taken into account when using this product:

#### **Danger associated with**

- Lifting and carrying
- Electric current
- Moving parts
- EMC disturbances
- Mechanical overload
- Thermal overload

#### **Note:**

**To prevent damage and injury and minimize any residual risks, observe the provided safety notices at all times.**

#### 1.2.3.1 Qualified personnel

Use of the products described in this manual is restricted to the following persons:

- Qualified personnel who are familiar with relevant drive technology products as well as applicable standards and regulations
- Qualified personnel who plan, develop, install and commission drive technology in machines and systems

Qualified personnel in the context of the products described in this manual are those who, because of their training, experience and instruction combined with their knowledge of relevant standards, regulations, accident prevention guidelines and operating conditions, are qualified to carry out essential tasks and recognize and avoid potentially dangerous situations.

The safety notices, connection descriptions (type plate and documentation) and limit values listed in the technical data are to be read carefully before installation and commissioning and must be observed.

In this regard, sufficient language skills are also required in order to be able to properly understand this manual.

#### **Danger!**

**The improper handling of servo drives and servo motors can cause severe personal injury or damage to property!**

### 1.2.3.2 Unauthorized modifications

#### **Warning!**

- **Unauthorized modifications to the servo motor are prohibited for reasons of safety. If modifications are required, please contact B&R.**
- **Removing or disabling the servo motor's safety features is not permitted.**

#### **Danger!**

**Improper control of motors can result in unintended hazardous movements! Such incorrect behavior can have various causes:**

- **Incorrect installation or mishandling of components**
- **Improper or incomplete wiring**
- **Defective devices (servo drive, motor, position encoder, cables, brake)**
- **Incorrect control (e.g. caused by software error)**

#### **Danger!**

**Electronic devices are never completely failsafe. If the servo drive fails, the user is responsible for ensuring that the connected motor is brought to a secure state!**

#### **Warning!**

**High temperatures can occur on the surface of the 8LS three-phase synchronous motors (>100°C). If necessary, protection against accidental contact must be installed!**

### 1.2.3.3 Free convection

#### **Caution!**

- **Free convection on the motor housing must be guaranteed!**
- **In the case of motors cooled by external fans, it must be ensured that warm exhaust air cannot be drawn back into the intake!**

#### **Danger!**

**Servo drives and servo motors can have bare parts with voltages applied (e.g. terminals) or hot surfaces. Additional hazards include moving machine parts. The removal of required covers, inappropriate use of the devices or their improper installation or operation can result in severe personal injury or damage to property!**

## 1.2.4 Safety guidelines - Transport and storage

Temperature and humidity specifications for transport and storage can be found in the section "General motor data: Storage and transport conditions".

### 1.2.4.1 Transport

Appropriate load bearing equipment must be used during transport and installation. Observe all applicable local regulations.

Lifting devices, ground conveyors and load suspension equipment must comply with the applicable regulations. Do not exceed the maximum capacity of lifting equipment. Use suitable cable guidance or spreading equipment, particularly if the motor is equipped with built-on assemblies. The weight of the motor is listed in the technical data section of this manual.

#### **Danger!**

**Failure to comply with instructions, guidelines and regulations or use of unsuitable or damaged tools and equipment can result in serious injury and/or material damage.**

Only lift the motor using the lifting lugs, if provided. The motor must not be lifted or transported by means of the shaft end, power connector, signal connector or fan.

## Warning!

**Suitable load suspension equipment, such as straps, slings, etc., must be used. If provided, the lifting lugs on the motor can also be used. Terminal boxes and motor connectors are not permitted to be used to lift the motor or secure it during transport. Observe all applicable local regulations during transport. Equipment used to lift, transport or suspend loads must comply with applicable regulations.**

### 1.2.4.2 Storage

Motors should not be stored for longer than 2 years to maintain the service life of the grease.

#### Storage conditions:

- The room must be dry, dust-free and free of vibrations.
- The relative humidity must be less than 90% (non-condensing).
- The temperature must be between -20°C and +60°C.
- The room must be well ventilated. The room must offer protection against extreme weather.
- The air in the room must be free of aggressive or hazardous gases.

#### Handling the motor:

- Apply a preservative coating to unprotected components such as the shaft end.
- Ensure that the motor is well covered.
- Avoid contact corrosion.

## Caution!

**To ensure proper lubrication of the grooved ball bearings after long storage times, the motor shaft must be turned a few revolutions manually at least every 2 months.**

### 1.2.5 Safety guidelines - Installation

Installation must be performed as described in this manual using suitable equipment and tools.

Devices are only permitted to be installed by qualified personnel without voltage applied. Before installation, voltage to the control cabinet must be switched off and prevented from being switched on again.

General safety guidelines and national accident prevention regulations (e.g. VBG 4) for working with high voltage systems must be observed.

Electrical installation must be carried out in accordance with applicable guidelines (e.g. line cross sections, fuses, protective ground connections). Note the specifications provided in the "Technical data" chapter.

#### 1.2.5.1 No direct mains connection

## Warning!

**B&R's three-phase synchronous motors are not permitted to be connected directly to the power mains, they are only permitted to be operated in combination with ACOPOS servo drive systems!**

#### 1.2.5.2 Damaged servo motor

## Warning!

- **Never install a damaged servo motor.**
- **Never operate a damaged servo motor.**
- **Never install a servo motor in a damaged machine.**
- **Before installation, ensure that the servo motor is suitable for your machine.**

### 1.2.5.3 Overdetermined bearings

#### **Caution!**

When installing drive elements on the motor shaft, avoid overdetermined bearings. The necessarily occurring tolerances cause additional forces on the motor shaft bearings. This can damage or significantly reduce the service life of the bearings!

### 1.2.5.4 Axial forces

#### **Warning!**

Excessive axial forces on the motor shaft during installation can damage the bearings and weaken the motor holding brake until the braking effect is reduced or nonexistent. Encoder errors can also occur.

Therefore, excessive pressure or shocks to the front shaft end or the rear housing cover should be avoided under all circumstances.

The blow of a hammer certainly exceeds the permissible thresholds!

#### 1.2.5.4.1 Axial load on shaft

#### **Warning!**

Axial loads are not permitted on shaft ends of motors with holding brakes. It is especially important to prevent axial forces in the direction of the B flange since these forces can cause the brake to fail!

#### **Information:**

Axial loads are not permitted on shaft ends of motors with EnDat encoders. It is especially important to prevent axial forces in the direction of the B flange since these forces can cause encoder errors!

### 1.2.5.5 No shocks or impacts

#### **Caution!**

Bearing elements must not be subjected to shocks or impacts! Incorrect handling will reduce the service life and result in damage to the bearings.

### 1.2.5.6 Connection of pinion gears

#### **Note:**

Use suitable clamping sets, pressure sleeves or other fastening elements to connect pinion gears, belt disks or similar drive elements.

Drive elements must be protected against unintentional removal.

### 1.2.5.7 Lubrication of oil seal

#### **Note:**

Proper lubrication of the oil seal must be ensured throughout the entire service life of the motor.

### 1.2.5.8 Using 3rd-party cables

#### **Note:**

The cable can have a negative effect on voltage overshoots on the winding. If non-B&R cables are used, documented evidence of conformity with voltage class A in accordance with EN 60034-25 must be provided. Without documented evidence, no claim for warranty is possible for winding damage resulting from voltage overshoots on the winding.

### 1.2.5.9 Ensure proper connections

#### **Caution!**

**The connectors must be connected and fastened correctly. Misalignment and subsequent pulling can cause disturbances and damage to the servo motor!**

### 1.2.6 Safety guidelines - Operation

#### 1.2.6.1 Responsibilities of the operator

##### Definition of the term "operator"

The operator is the person who uses the servo motor for commercial purposes, or who provides it for use by a 3rd party while carrying legal product responsibility for the protection of the user, personnel or other 3rd parties.

##### Obligations of the operator

###### The operator is obligated

- to know and implement the applicable industrial safety regulations
- to conduct a risk assessment to identify hazards related to on-site working conditions
- to create a manual for operating the servo motor
- to periodically verify that operating instructions correspond with the current status of applicable regulations
- to clearly define and assign responsibilities for installation, operation, troubleshooting, maintenance and cleaning
- to ensure that all employees have read and understood the operating instructions
- to provide personnel with regular training and inform them of hazards
- to provide personnel with the necessary protective equipment

#### **Warning!**

**During operation, the machine may exceed the permissible noise level for a work environment and may cause hearing damage.**

**Suitable noise reduction measures must be implemented. These may include housings, covers or other noise insulating measures.**

#### 1.2.6.2 Protection against touching electrical parts

#### **Danger!**

**To operate servo drives, it is necessary for certain parts to carry dangerous voltages over 42 VDC. Touching one of these parts can result in a life-threatening electric shock. This could lead to death, severe injury or damage to equipment!**

Before turning on a servo drive, it is important to ensure that the housing is properly connected to ground (PE rail). The ground connection must be established even when testing or operating the drive for a short time!

Before switching on the device, all parts that carry voltage must be securely covered. During operation, all covers and control cabinet doors must remain closed.

Control and power connections can still carry voltage even if the motor is not turning. Touching these connections while the device is switched on is prohibited. Before performing any work on servo drives, they must first be disconnected from the power system and prevented from being switched on again.

### 1.2.6.3 Protection against hazardous movements

#### **Danger!**

**Improper control of motors can result in unintended hazardous movements! Such incorrect behavior can have various causes:**

- **Incorrect installation or mishandling of components**
- **Improper or incomplete wiring**
- **Defective devices (servo drive, motor, position encoder, cables, brake)**
- **Incorrect control (e.g. caused by software error)**

Some of the errors listed above can be detected and prevented by the servo drive's internal monitoring. Nevertheless, it is still possible for the motor shaft to move any time after the device is switched on! For this reason, higher-level safety precautions need to be put in place to ensure that personnel and machines are protected.

The moving parts on machines must be shielded in such a way as to prevent unintentional access by personnel. This type of protection can be achieved by using stable mechanical protective equipment such as protective covers, protective fences, protective gates or photoelectric sensors.

Removing, bypassing or circumventing these protective measures and entering the area where movement takes place is prohibited.

A sufficient number of emergency stop buttons must be installed in direct proximity to the machine and be easily accessible at all times. This emergency stop equipment must be checked before the machine is put into operation.

On free running motors, the shaft key (if present), mounting screws or other mounting elements must be removed or measures taken to prevent them from being ejected.

The holding brake built into motors (if present) cannot prevent hoisting equipment from dropping hanging loads.

#### **Danger!**

**Servo motors can be started automatically via remote control! If appropriate, a corresponding warning symbol must be applied, and protective measures must be implemented to prevent entry into the high-risk area.**

### 1.2.6.4 Protection against burns

The surfaces of servo drives and servo motors can reach very high temperatures during operation.

Servo drives and servo motors are therefore labeled with the following warning:



Figure 1: Warning on the servo drive

#### **Note:**

**A "hot surface" warning sticker is provided with the servo motors. It must be applied so that it is visible at all times after the motor has been mounted.**

### 1.2.6.5 Electromagnetic fields

Electromagnetic fields are generated by the operation of electrical power engineering installations such as transformers, drives or motors.

The plant operator is responsible for taking appropriate measures (labels and hazard warnings) to adequately protect operating personnel and others against any possible risk.



## **Danger!**

Electromagnetic fields can interfere with electronic devices, causing them to malfunction. For example, the operation of heart pacemakers can be impaired, potentially leading to personal harm or even death. Persons with heart pacemakers are therefore forbidden from entering these areas.

- Observe the relevant nationally applicable health and safety regulations.
- Display adequate hazard warning notices.
- Place barriers around hazardous areas.
- Take measures, by using shields, for example, to reduce electromagnetic fields at their source.

### 1.2.6.6 Shaft key

## **Caution!**

The shaft key can become dislodged during heavy reverse operation. In extreme cases, this can cause the shaft end to break!

It is therefore preferable to use a smooth shaft.

### 1.2.6.7 Simultaneous loads on shaft end

## **Warning!**

Simultaneously loading the shaft end with the maximum values of  $F_r$  and  $F_a$  is not permitted! Contact B&R if this occurs.

### 1.2.6.8 Holding brake

## **Warning!**

The holding brake is not intended for normal braking. The holding brake does not provide protection for personnel. The maximum motor torque far exceeds the holding torque for the brake.

## 1.2.7 Safety guidelines - Disposal

### 1.2.7.1 Rare-earth magnets

## **Caution!**

B&R servo motors contain rare-earth magnets with increased density of magnetic energy!

### 1.2.7.2 Magnetized rotor

## **Warning!**

A magnetized rotor must never be transported or delivered outside the stator!

## 1.3 8LS three-phase synchronous motors



B&R's 8LS three-phase synchronous motors have been specially developed for use in high-performance applications. They are now being used to produce consumer goods and products in the plastic, packaging, metal, food and beverage industries and then palletize them with material handling systems. To have a complete solution from a single source, not only do you need the right components, you need them tailored to the application at hand. The large selection of available 8LS three-phase synchronous motors makes it possible to easily meet conditions such as reducing the variety of parts, guaranteeing ease of service and maintaining minimum requirements on space.

An optimum selection of power transmission technology is the perfect way to round off a successful machine design. To meet this goal, specialists are available at B&R subsidiaries all over the world who are eager to share their know-how in the area of mechatronics. B&R automation components: the economical combination of mechanics, electronics, technology and innovation.

### 1.3.1 Standards, guidelines and certifications - 8LS

8LS servo motors are intended for use in commercial plants and subject to the following standards and guidelines:

#### Standards

EN 60034- 1	Rotating electrical machines - measurement and operating behavior
EN 60034- 5	Degrees of protection provided by the integral design of rotating electrical machines
EN 60034- 6	Rotating electrical machines - Cooling types
EN 60034- 7	Rotating electrical machines - Classification of types of construction, mounting arrangements
EN 60034- 11	Rotating electrical machines - Thermal protection
EN 60034- 14	Mechanical vibration of certain machines with shaft heights 56 mm and higher

Table 2: Standards

#### Guidelines

Low voltage directive 2006/95/EC	8LS servo motors conform with the low voltage directive.
EMC directive 2004/108/EC	To operate an 8LS servo motor in accordance with its intended use, it must comply with the specifications of the EMC directive. Proper installation (e.g. spatial separation of signal lines and power cables, shielded lines and cables) is the responsibility of the plant installer and system supplier. If operating with a power converter, then the EMC guidelines of the power converter, encoder and brake manufacturers must be observed.
RoHS 2 directive 2011/65/EU	8LS motors comply with the RoHS 2 directive (2011/65/EU) for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Table 3: Guidelines

#### Note:

Also observe the relevant national, local and plant-specific regulations.

### 1.3.1.1 Certifications

General information	Cooling / construction type A	Cooling / construction type C
C-UR-US listed	Yes	Yes
UL file number	PRHZ2.E235396	

### 1.3.2 8LS type plate

Each servo motor is uniquely identified by its type plate. The motor number ensures traceability.

#### Note:

- The type plate must be visible at all times.
- The type plate is not permitted to be removed from the motor.

#### 1.3.2.1 Embedded parameter chip

All relevant mechanical and electrical information and data is stored in the EnDat encoder used for 8LS three-phase synchronous motors. This means that the user doesn't have to configure settings on the servo drive in the field. As soon as the encoder is connected to the servo drive and the power is applied to the electronics, the motor is automatically identified. The motor sends its rated parameters and limit parameters to the servo drive. The drive then automatically determines the current limits and current control parameters required for optimal control of the motor. The user things that the user has to optimize are the speed and position controllers. The integrated commissioning environment in B&R Automation Studio™ provides all necessary support.

In addition to assistance during commissioning, routine service work is also simplified, and motors can be exchanged without having to take extra time to set parameters.

### 1.3.3 Assignment of protection ratings

#### Note:

The listed protection ratings are only achieved if the power and signal connections are installed properly.

#### 1.3.3.1 Protection ratings

8LS motors are designed with options to achieve the following protection ratings in accordance with EN 60034-5.

Basic motor	IP64
Basic motor + optional oil seal	IP65
Basic motor + optional fan	IP20

### 1.3.4 Connection type

#### General information

The uniform connection technology, the pre-assembled cables and the embedded parameter chip allow "plug and play" operation of the power transmission system. The angled connectors can be swiveled for maximum cabling flexibility. Thanks to the digital signal transmission, B&R's innovative and sturdy single-cable solution (hybrid motor cables) can be used, which combines servo feedback and power for streamlined installation. The winding insulation of motors with an attachment cable and servo drive from B&R are tested extensively in accordance with IEC TS 60034-25 limit curves and are certified by the TÜV in the area of safety technology.

In the case of motors with the single-cable solution (hybrid connector), the temperature signal is not transmitted via two separate lines as before. Instead, it is transmitted digitally via the encoder interface.

The following conditions must be met by the drives in order to operate a motor with a hybrid connector:

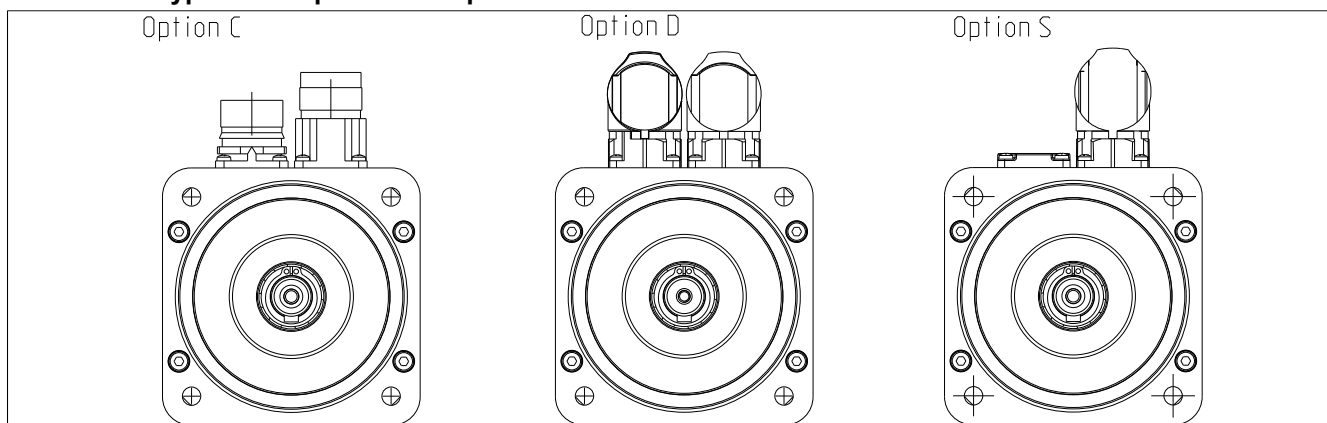
- For ACOPOSmulti: the cable cover must be designed for operation with a hybrid cable (with cable cutout; delivered 2015 or later)
- For ACOPOSmulti with SafeMOTION: the operating system (NC version) must be set to V2.48.0 or higher; the Safety Release must be V1.9 or higher
- For all drives: the operating system (NC version) must be set to V2.42.2 or higher

**NOTE:** If the conditions listed above are not met, temperature evaluation on the drive will not work.

The 8LS series offers three connection type options.

- Option "C": straight built-in connector, one each for power and signal
- Option "D": Angled swivel built-in connector, one each for power and signal connection
- Option "S": Single-cable solution with hybrid built-in connector for both power and signal

#### Connection types - Comparison of options



### 1.3.5 8LS delivery

Deliveries are assembled by order. Immediately report any transport damage directly to the shipping company. Check immediately that the received motor matches the order data.

Contact the responsible B&R technical office if you notice any missing or defective items.

## 2 Technical data

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### 2.1 General description

Three-phase synchronous motors from the 8LS series are permanent magnet, electronically commutated synchronous motors for applications that require excellent dynamic characteristics and positioning precision as well as compact size and reduced weight.

- Compact sizes result in low weight and optimal power density
- Single-cable solution (hybrid) available
- Easier construction
- Fast axes thanks to impressive dynamic properties
- Universal application thanks to overload capability
- Good controllability thanks to optimized torque rippling
- Encoders for functional safety available
- Fan-cooling or self-cooling models
- Extremely easy to service
- Low costs

#### 2.1.1 Cooling / Construction types

The technical data provided in this manual is arranged according to the cooling/construction type of the respective 8LS motors.

##### Cooling / Construction type A

8LS three-phase synchronous motors with cooling / construction type A are self-cooling and have a long, slim design. The motors must be installed on the cooling surface (flange).

##### Cooling / Construction type B

Three-phase synchronous motors with cooling type C are based on 8LS motors with cooling/construction type A. They are separately cooled and the only difference is a fan module mounted in the area of the B-side bearing.

The motors must be installed on the cooling surface (flange). The fan module increases the nominal torque ( $M_N$ ), nominal current ( $I_N$ ), stall torque ( $M_0$ ) and stall current ( $I_0$ ) by approximately 30% compared to the motors with cooling type A, depending on the mounting situation.

##### 2.1.1.1 Sizes

8LS three-phase synchronous motors with cooling/construction type A are available in seven different sizes (2 through 8). They have different dimensions (especially flange dimensions) and power ratings.

These different sizes are indicated by a number represented by (c) in the model number. The larger the number, the larger the flange dimensions and power rating for the respective motor.

## Overview of 8LSA and 8LSC sizes and lengths

Length	Available sizes						
	2 <sup>1)</sup>	3 <sup>1)</sup>	4	5	6	7	8
3	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	-	Yes	-	Yes	-	Yes	-
8	-	-	-	-	-	Yes	-

<sup>1)</sup> Only for cooling type A

### 2.1.2 Lifting eye bolts - Overview

#### 8LSA and 8LSC V3

Motor	Lifting eye bolts	Motor	Lifting eye bolts
8LSA73	Yes	8LSC73	Yes
8LSA74	Yes	8LSC74	Yes
8LSA75	Yes	8LSC75	Yes
8LSA76	Yes	8LSC76	Yes
8LSA77	Yes	8LSC77	Yes
8LSA78	Yes	8LSC78	Yes
8LSA83	Yes	8LSC83	Yes
8LSA84	Yes	8LSC84	Yes
8LSA85	Yes	8LSC85	Yes
8LSA86	Yes	8LSC86	Yes

### Caution!

The eye bolts included in delivery are intended exclusively for lifting the motor without any additional components installed!

## 2.2 Motor encoder systems

### General

8LS three-phase synchronous motors are available with EnDat encoders as well as resolvers. The encoder system is listed as part of the model number in the form of a 2-digit code (ee).

### Analog and digital transfer

A resolver is an analog encoder system. Resolvers are particularly robust against vibrations and high operating temperatures. Their disadvantage is the low precision of 6-10 arcmin. There is still no multi-turn variant with resolvers.

Digital encoders use a serial transfer protocol. This protocol is called EnDat. The EnDat protocol is a developed standard that incorporates the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. The embedded parameter chip is stored by B&R in this encoder memory. This data and the B&R ACOPOS systems form a plug-and-play drive solution. Absolute positioning can be used within a revolution with the single-turn variants. A homing procedure is not required because of the absolute position measurement. For applications where the motor covers several revolutions for positioning, a multi-turn encoder that can save up to 65535 revolutions can be used. A solution with a single-turn encoder variant with a homing procedure is also possible. In EnDat 2.1 analog/digital sampling, a very fine resolution is achieved by the evaluation modules developed by B&R.

### 2.2.1 EnDat 2.2

For the advanced, fully digital EnDat 2.2 protocol, the positions are generated directly in the encoder and communicated serially with the drive system. This transfer is very robust in relation to disturbances and is even certified for safety applications.

EnDat 2.2 is therefore to be preferred over the older EnDat 2.1 variant.

### 2.2.2 Safety encoders - General information

#### Safety-related position measurement systems

In machine and system manufacturing, the topic of safety is becoming more and more important. This is mirrored in legislation and stricter safety criteria in national and international standards. Most importantly, stricter requirements serve to protect personnel, but they also increasingly serve to protect property and the environment. The goal of functional safety is to minimize or eliminate dangerous situations that can occur in machines and systems either with or without operational errors. This is generally achieved by implementing redundant systems. Moving axes in safety-oriented applications require position information in order to be able to carry out their corresponding safety functions. Different system configurations can be implemented to get independent position values. One possibility is using two measuring instruments per axis. To keep costs down, the aim is often to create a solution with only one position measuring instrument. Until now, analog measuring instruments with sine/cosine signals were used for this purpose. The encoder manufacturer Heidenhain – as the first manufacturer with the purely serial EnDat 2.2 protocol for safety position measurement systems – offers a serial single-encoder solution in accordance with IEC 61 508 SIL2. All the advantages of serial data transfer – such as cost optimization, diagnostics possibilities, automatic commissioning and high-speed generation of position values – can now benefit safety applications as well.

100% inspection during production and additional measures during final testing ensure errors have not occurred related to shaft and coupling connections on rotary encoders when using motors with safety encoders (in accordance with EN ISO 13849-2).

There are also a number of safety functions that are already possible with D encoders.

### 2.2.3 Note regarding SafeMOTION

Information regarding the area of application and the procedure for setting up various safety functions can be found in the "ACOPOSmulti SafeMOTION" user's manual. (Model number: MAACPMSAFEMC-GER ACOPOS-multi SafeMOTION or in the Downloads section of our website)

### 2.2.4 Resolvers

#### General information

"R0" resolvers are still used with the 8LSA2 motors.

## Technical data

For all other 8LSA motors size 3 and higher and 8LSC motors, "R2" resolvers are used.

### Technical data

Name	Order code (ee)	
	R0	R2
Precision [°]	10	6
Vibration during operation [m/s <sup>2</sup> ]	10 < f ≤ 500 Hz: ≤196	55 < f ≤ 2000 Hz: <500
Shock during operation [m/s <sup>2</sup> ] Duration 11 ms	≤981	≤1000

## 2.2.5 EnDat 2.1 and EnDat 2.2 encoders - Technical data

### Inductive encoder for motor size 2

Encoder type / Order code	E8	E9	D8	D9	S8	S9
Operating principle	Inductive					
EnDat protocol	2.1	2.1	2.2	2.2	2.2	2.2
Functional safety	No	No	No	No	Yes	Yes
Single-turn / Multi-turn	S	M	S	M	S	M
Revolutions	1	4096	1	4096	1	4096
Number of lines	32		Digital pos. in the encoder			
Resolution [bits single-turn / bits multi-turn]	18/0	18/12	19/0	19/12	19/0	19/12
Precision [°]	280		120			
Switching frequency ≥ [kHz]	6		Digital pos. in the encoder			
Vibration during operation - Stator Max [m/s <sup>2</sup> ]	200		400			
Vibration during operation - Rotor max [m/s <sup>2</sup> ]	200		600			
Shock during operation max [m/ s <sup>2</sup> ]	1000		2000			
Manufacturer's product ID	ECI 1118	EQI 1130	ECI 1119 FS	EQI 1131 FS	ECI 1119 FS	EQI 1131 FS
Manufacturer's website	www.heidenhain.de					

### Optical encoder for motor size 2

Encoder type / Order code	E4	E5	D4	D5	S4	S5
Operating principle	Optical					
EnDat protocol	2.1	2.1	2.2	2.2	2.2	2.2
Functional safety	No	No	No	No	Yes	Yes
Single-turn / Multi-turn	S	M	S	M	S	M
Revolutions	1	4096	1	4096	1	4096
Number of lines	512		Digital pos. in the encoder			
Resolution [bits single-turn / bits multi-turn]	13/0	13/12	25/0	25/12	25/0	25/12
Precision [°]	60	60	20			
Switching frequency ≥ [kHz]	190		Digital pos. in the encoder			
Vibration during operation - Stator Max [m/s <sup>2</sup> ]	200					
Vibration during operation - Rotor max [m/s <sup>2</sup> ]	200					
Shock during operation max [m/ s <sup>2</sup> ]	1000					
Manufacturer's product ID	ECN 1113	EQN 1125	ECN 1123 FS	EQN 1135 FS	ECN 1123 FS	EQN1135 FS
Manufacturer's website	www.heidenhain.de					



**Inductive encoder for motor sizes 3 - 8, with the exception of 8LSC5A/B/C!**

Encoder type / Order code	EA	EB	DA	DB	SA	SB
Operating principle	Inductive					
EnDat protocol	2.1	2.1	2.2	2.2	2.2	2.2
Functional safety	No	No	No	No	Yes	Yes
Single-turn / Multi-turn	S	M	S	M	S	M
Revolutions	1	4096	1	4096	1	4096
Number of lines	32		Digital pos. in the encoder			
Resolution [bits single-turn / bits multi-turn]	19/0	19/12	19/0	19/12	19/0	19/12
Precision ["]	180		65			
Switching frequency ≥ [kHz]	6		Digital pos. in the encoder			
Vibration during operation - Stator Max [m/s <sup>2</sup> ]	200		400			
Vibration during operation - Rotor max [m/s <sup>2</sup> ]	200		600			
Shock during operation max [m/s <sup>2</sup> ]	2000		2000			
Manufacturer's product ID	ECI 1319	EQI 1331	ECI 1319 FS	EQI 1331 FS	ECI 1319 FS	EQI 1331 FS
Manufacturer's website	www.heidenhain.de					

The inductive encoders with product IDs "EA" and "EB" replace the encoder types with model numbers "E2" and "E3". These encoders should be used in all new applications.

The "EB" encoder type requires the following versions of our servo drives or inverter modules:

(ACP10\_SYS or firmware version)

- ACOPOS: Starting with V2.090 from 2008-09-18
- ACOPOSmulti: Starting with V2.031 from 2008-01-17

For older basic versions of the ACOPOS firmware, using the new encoder is possible starting with V0.556 (from 2010-07-22) for ACOPOS with AC110 (CAN bus) and starting with V1.249 (from 2010-07-22) for ACOPOS with AC112/114.

**Optical encoder for motor sizes 3 - 8**

Encoder type / Order code	E0	E1	D0	D1	S0	S1
Operating principle	Optical					
EnDat protocol	2.1	2.1	2.2	2.2	2.2	2.2
Functional safety	No	No	No	No	Yes	Yes
Single-turn / Multi-turn	S	M	S	M	S	M
Revolutions	1	4096	1	4096	1	4096
Number of lines	512		Digital pos. in the encoder			
Resolution [bits single-turn / bits multi-turn]	13/0	13/12	25/0	25/12	25/0	25/12
Precision ["]	60		20			
Switching frequency ≥ [kHz]	130		Digital pos. in the encoder			
Vibration during operation - Stator Max [m/s <sup>2</sup> ]	300					
Vibration during operation - Rotor max [m/s <sup>2</sup> ]	300					
Shock during operation max [m/s <sup>2</sup> ]	2000					
Manufacturer's product ID	ECN 1313	EQN 1325	ECN 1325 FS	EQN 1135 FS	ECN 1325 FS	EQN 1135 FS
Manufacturer's website	www.heidenhain.de					

**NOTE:** Motors with "S encoders" (functional safety) cannot be combined with gearboxes!

**NOTE:** S encoders are currently not available for 8LASC5A/B/C motors.

## 2.3 Motor options and special motor options

8LS three-phase synchronous motors can be delivered with various options depending on the cooling type, size and length:

- With various nominal speeds
- With or without an oil seal
- With or without a holding brake
- With reinforced brake
- With a smooth or keyed shaft
- With reinforced bearings
- With two different connection directions (two cables)
- Now also with single-cable (hybrid) solution

### Overview of 8LSA and 8LSC sizes and lengths

Length	Available sizes						
	2 <sup>1)</sup>	3 <sup>1)</sup>	4	5	6	7	8
3	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	-	Yes	-	Yes	-	Yes	-
8	-	-	-	-	-	Yes	-

<sup>1)</sup> Only for cooling type A

### 2.3.1 Available nominal speeds

#### 2.3.1.1 Nominal speeds - Cooling type A

8LS three-phase synchronous motors are available with different nominal speeds depending on the size and length.

#### Size 2

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1500	2000	2200	3000	4500	6000
8LSA23	---	---	---	---	---	Yes
8LSA24	---	---	---	---	---	Yes
8LSA25	---	---	---	---	Yes	Yes
8LSA26	---	---	---	---	Yes	Yes

Table 4: Cooling type A, size 2 - Available nominal speeds

#### Size 3

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1500	2000	2200	3000	4500	6000
8LSA33	---	---	---	Yes	Yes	Yes
8LSA34	---	---	Yes	Yes	Yes	Yes
8LSA35	---	---	Yes	Yes	Yes	Yes
8LSA36	---	---	Yes	Yes	Yes	Yes
8LSA37	---	---	Yes	Yes	Yes	Yes

Table 5: Cooling type A, size 3 - Available nominal speeds

#### Size 4

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2200	3000	4500	6000
8LSA43	---	Yes	Yes	Yes	Yes	Yes
8LSA44	Yes	Yes	Yes	Yes	Yes	Yes
8LSA45	---	Yes	Yes	Yes	Yes	Yes
8LSA46	Yes	Yes	Yes	Yes	Yes	Yes

Table 6: Cooling type A, size 4 - Available nominal speeds

## Size 5

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2000	2200	3000	4500
8LSA53	---	---	Yes	Yes	Yes	Yes
8LSA54	Yes	---	Yes	Yes	Yes	Yes
8LSA55	---	---	Yes	Yes	Yes	Yes
8LSA56	---	Yes	Yes	Yes	Yes	Yes
8LSA57	---	Yes	Yes	Yes	Yes	Yes

Table 7: Cooling type A, size 5 - Available nominal speeds

## Size 6

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2000	2200	3000	4500
8LSA63	---	Yes	---	Yes	Yes	Yes
8LSA64	---	Yes	---	Yes	Yes	Yes
8LSA65	---	Yes	---	Yes	Yes	Yes
8LSA66	---	Yes	---	Yes	Yes	Yes

Table 8: Cooling type A, size 6 - Available nominal speeds

## Size 7

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2000	2200	3000	4500
8LSA73	---	---	Yes	Yes	Yes	Yes
8LSA74	---	Yes	Yes	Yes	Yes	Yes
8LSA75	Yes	Yes	Yes	Yes	Yes	---
8LSA76	---	Yes	---	Yes	Yes	---
8LSA77	---	---	---	---	Yes	---
8LSA78	---	---	---	---	Yes	---

Table 9: Cooling type A, size 7 - Available nominal speeds

## Size 8

Motor size and length	Available nominal speeds $n_N$ [rpm]				
	1100	1500	2000	2200	3000
8LSA83	---	---	Yes	Yes	Yes
8LSA84	---	Yes	Yes	Yes	Yes
8LSA85	---	Yes	Yes	Yes	---
8LSA86	---	---	Yes	Yes	Yes

Table 10: Cooling type A, size 8 - Available nominal speeds

### 2.3.1.2 Nominal speeds - Cooling type C

8LS three-phase synchronous motors are available with different nominal speeds depending on the size and length.

## Size 4

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2200	3000	4500	6000
8LSC43	---	---	Yes	Yes	Yes	Yes
8LSC44	Yes	Yes	Yes	Yes	Yes	Yes
8LSC45	---	---	Yes	Yes	Yes	Yes
8LSC46	---	---	Yes	Yes	Yes	Yes

Table 11: Cooling type C, size 4 - Available nominal speeds

## Size 5

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2000	2200	3000	4500
8LSC53	---	---	Yes	Yes	Yes	Yes
8LSC54	Yes	---	Yes	Yes	Yes	Yes
8LSC55	---	---	Yes	Yes	Yes	Yes
8LSC56	---	Yes	Yes	Yes	Yes	Yes
8LSC57	---	Yes	Yes	Yes	Yes	Yes

Table 12: Cooling type C, size 5 - Available nominal speeds

### Size 6

Motor size and length	Available nominal speeds $n_N$ [rpm]				
	1500	2000	2200	3000	4500
8LSC63	Yes	---	Yes	Yes	Yes
8LSC64	Yes	---	Yes	Yes	Yes
8LSC65	Yes	---	Yes	Yes	Yes
8LSC66	Yes	---	Yes	Yes	Yes

Table 13: Cooling type C, size 6 - Available nominal speeds

### Size 7

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2000	2200	3000	4500
8LSC73	---	---	Yes	Yes	Yes	Yes
8LSC74	---	---	Yes	Yes	Yes	Yes
8LSC75	Yes	Yes	Yes	Yes	Yes	---
8LSC76	---	Yes	---	Yes	Yes	---
8LSC77	---	---	---	---	Yes	---
8LSC78	---	---	---	---	Yes	---

Table 14: Cooling type C, size 7 - Available nominal speeds

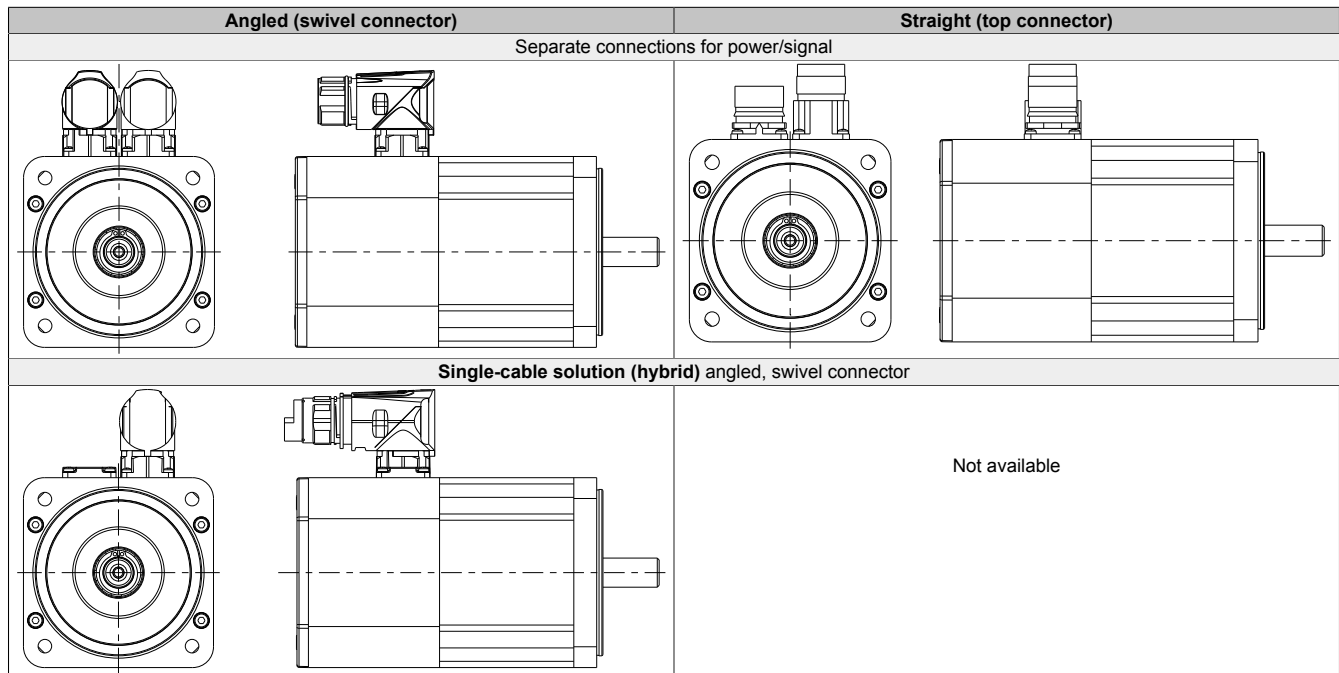
### Size 8

Motor size and length	Available nominal speeds $n_N$ [rpm]					
	1100	1500	2000	2200	3000	4500
8LSC83	---	Yes	Yes	Yes	Yes	---
8LSC84	Yes	Yes	Yes	Yes	Yes	---
8LSC85	Yes	Yes	Yes	---	---	---
8LSC86	---	Yes	Yes	---	---	---

Table 15: Cooling type C, size 8 - Available nominal speeds

### 2.3.2 Connection directions

8LS three-phase synchronous motors are available with two different connection directions.



### 2.3.3 Oil seal

All 8LS three-phase synchronous motors are available with an optional Form A oil seal in accordance with DIN 3760.

When equipped with an oil seal, the motors have IP65 protection in accordance with EN 60034-5.

To maintain functionality of the oil seal, it must be lubricated regularly with oil. An oil seal that is not lubricated will harden due to increased frictional heat and will eventually provide only dust protection.

#### Note:

**Proper lubrication of the oil seal must be ensured throughout the entire service life of the motor.**

**For this reason, mounting a gearbox on motors with an oil seal is not permitted!**

### 2.3.4 Design of the shaft end

All 8LS three-phase synchronous motor shafts conform to DIN 748. They are available with a smooth or keyed shaft.

#### Smooth shaft end

A smooth shaft end is used for a force-fit shaft-hub connection and guarantees a backlash-free connection between the shaft and hub as well as a high degree of operating smoothness. The end of the shaft has a threaded center hole.

#### Keyed shaft end

A keyed shaft end is used for a form-fit torque transfer with low demands on the shaft-hub connection and for handling torque in a constant direction.

The keyways for 8LS three-phase synchronous motors conform to keyway form N1 in accordance with DIN 6885-1. Form A keyed shafts that conform to DIN 6885-1 are used. Balancing motors with keyways is done using the shaft and fitment key convention in accordance with DIN ISO 8821.

The end of the shaft has a threaded center hole that can be used to mount drive elements with shaft end cover plates.

#### Caution!

**The shaft key can become dislodged during heavy reverse operation. In extreme cases, this can cause the shaft end to break!**

**It is therefore preferable to use a smooth shaft.**

### 2.3.4.1 Load capacity of the shaft end and bearing

8LS three-phase synchronous motors are equipped with grooved ball bearings which are sealed on both sides and greased. Radial and axial forces ( $F_r$ ,  $F_a$ ) applied to the shaft end during operation and installation must be within the specifications listed below. Bearing elements may not be subjected to shocks or impacts! Incorrect handling will reduce the service life and result in damage to the bearings.

#### Radial force

The radial force  $F_r$  on the shaft end is a function of the loads during installation (e.g. belt tension on pulleys) and operation (e.g. load torque on the pinion). The maximum radial force  $F_r$  depends on the shaft end type, bearing type, average speed, the position where the radial force is applied and the desired service life of the bearings.

#### Axial force, shift in shaft position caused by axial force

The axial force  $F_a$  on the shaft end is a function of the loads during installation (e.g. stress caused by mounting) and operation (e.g. thrust caused by slanted tooth pinions). The maximum axial force  $F_a$  depends on the bearing type and the desired lifespan of the bearings. The fixed bearing is secured on the A flange with a retaining ring. The floating bearing is preloaded on the B flange with a spring in the direction of the A flange. Axial forces in the direction of the B flange can cause the spring bias to be overcome, which shifts the shaft by the amount of axial backlash in the bearing (approx. 0.1 - 0.2 mm). This shift can cause problems on motors with holding brakes or all motors with inductive encoder systems. As a result, no axial force in excess of the calculated values is permitted in the direction of the B flange when using these motors. (see "Determining permissible values for  $F_r$  and  $F_a$ ")

Axial loads are not permitted on shaft ends of motors with holding brakes. It is especially important to prevent axial forces in the direction of the B flange since these forces can cause the brake to fail!

#### Determining permissible values for $F_r$ and $F_a$

Information regarding determination of permissible values for  $F_r$  and  $F_a$  can be taken from the motor data for the respective three-phase synchronous motors (see section "Radial force diagram"). Permissible values are based on a bearing lifespan of 20,000 h (bearing lifespan calculation based on DIN ISO 281).

## 2.3.5 Holding brake

All 8LS three-phase synchronous motors can be delivered with a holding brake. It is installed directly behind the A-flange on the motor and is used to hold the motor shaft when no power is applied to the servo motor.

### Operating principle

The holding brake is a permanently excited brake and can be controlled by the B&R servo drive system. Based on principle, this type of holding brake exhibits a minimal amount of backlash.

This brake is designed as a holding brake and is not permitted to be used for operational braking! Under these conditions, the brake has a service life of approximately 5,000,000 cycles (opening and closing the brake is one cycle). Loaded braking during an emergency stop is permitted but reduces its service life.

### Information:

The required brake holding torque is determined based on the actual load torque. If not enough information is known about the load torque, it is recommended to assume a safety factor of 2.

### Warning!

The holding brake is not intended for normal braking. The holding brake does not provide protection for personnel. The maximum motor torque far exceeds the holding torque for the brake.

### Technical data

Name	Motor size							
	2	3	4	5	6	7	8	
Holding torque $M_{Br}$ [Nm]	2.2	4	8	15	32	47	130	
Connected load $P_{On}$ [W]	8.2	13.4	18.0	24.0	26.0	20.4	50.0	
Supply current $I_{on}$ [A]	0.35	0.56	0.75	1.0	1.08	0.85	2.08	
Supply voltage $U_{on}$ [V]	24	24	24	24	24	24	24	
Moment of inertia $J_{Br}$ [kgcm <sup>2</sup> ]	0.12	0.38	0.54	1.66	5.85	32	53.0	
Mass $m_{Br}$ [kg]	0.19	0.29	0.46	0.9	1.6	3.8	5.35	

### Warning!

Over time, exposure to moisture and contamination can reduce the braking torque. The application should therefore check the braking torque from time to time using the brake test function with the safety factor required for the application. If the brake is no longer achieving the necessary torque, a refresh cycle can help it achieve the necessary torque again. During a refresh cycle, the motor is allowed to turn one revolution at a speed of 50 rpm with the brake engaged. This cleans the brake pads and generally helps the brake to once again achieve the torque it needs. After the refresh cycle, the brake should be tested again. If the brake is still not achieving the necessary torque after 5 refresh cycles, the motor must be replaced.

### 2.3.5.1 Heavy Duty Brake

8LS three-phase synchronous motors in sizes 4 - 7 that have normal A side bearings can be delivered with a reinforced holding brake. Combining a "reinforced A-side bearing" with a reinforced brake is **not possible!**

### Technical data – Reinforced holding brake

Name	Motor size				
	3	4	5	6	7
Holding torque $M_{Br}$ [Nm]	9	15	60	60	80
Connected load $P_{on}$ [W]	15	18.0	25.0	25.0	36.5
Supply current $I_{on}$ [A]	0.63	0.75	1.04	1.04	1.52
Supply voltage $U_{on}$ [V] DC	24	24	24	24	24
Moment of inertia $J_{Br}$ [kgcm <sup>2</sup> ]	0.55	1.35	14.7	14.7	27.0
Mass $m_{Br}$ [kg]	0.52	0.98	3.23	3.23	4.4

The technical data for the **special brake** with special option "reinforced A-bearing" can be found in the "Special motor options" section.

### 2.3.6 Determining the order code for motor options (ff)

The respective code (ff) for the order key can be found in the following table:

The respective code (ff) for the order key can be found in the following table. Important: The combination "**reinforced holding brake**" with special motor option "**reinforced A-side bearing**" is **not possible!**

Motor option				
Connection direction	Oil seal	Holding brake	Shaft end	Code for the order key (ff)
Straight (top connector)	No	No	Smooth	C0
			Keyed	C1
		Normal	Smooth	C2
			Keyed	C3
			Smooth	C4
			Keyed	C5
	Yes	No	Smooth	C6
			Keyed	C7
		Normal	Smooth	C8
			Keyed	C9
			Smooth	CA
			Keyed	CB
Angled, swivel connector	No	No	Smooth	D0
			Keyed	D1
		Normal	Smooth	D2
			Keyed	D3
			Smooth	D4
			Keyed	D5
	Yes	No	Smooth	D6
			Keyed	D7
		Normal	Smooth	D8
			Keyed	D9
			Smooth	DA
			Keyed	DB
Angled single-cable solution (hybrid), swivel connector	No	No	Smooth	S0
			Keyed	S1
		Normal	Smooth	S2
			Keyed	S3
			Smooth	S4
			Keyed	S5
	Yes	No	Smooth	S6
			Keyed	S7
		Normal	Smooth	S8
			Keyed	S9
			Smooth	SA
			Keyed	SB

The single-cable solution (hybrid) can only be used for motors with connector size 1.0.

**Important:** The single-cable solution is fundamentally possible up to size 65. For larger sizes please consult the table.

In the case of motors with the single-cable solution (hybrid connector), the temperature signal is not transmitted via two separate lines as before. Instead, it is transmitted digitally via the encoder interface.

The following conditions must be met by the drives in order to operate a motor with a hybrid connector:

- For ACOPOSmulti: the cable cover must be designed for operation with a hybrid cable (with cable cutout; delivered 2015 or later)
- For ACOPOSmulti with SafeMOTION: the operating system (NC version) must be set to V2.48.0 or higher; the Safety Release must be V1.9 or higher
- For all drives: the operating system (NC version) must be set to V2.42.2 or higher

**NOTE:** If the conditions listed above are not met, temperature evaluation on the drive will not work.



**Connector size table (built-in connector on motor) for single-cable solution (hybrid)**

Motor sizes 2 through 6 are available with the single-cable (hybrid) solution, except for the exceptions named in the table. Size 7 motors are available in certain lengths with certain speeds that allow a size 1 built-in connector and are therefore also available with the single-cable (hybrid) solution.

Motor code	Size	SCS	Motor code	Size	SCS	Motor code	Size	SCS
8LSA66.ee015ffgg-3	1	Yes	8LSA73.ee045ffgg-3	1.5	No	8LSC74.ee045ffgg-3	1.5	No
8LSC66.ee015ffgg-3	1	Yes	8LSC73.ee045ffgg-3	1.5	No	8LSA75.ee015ffgg-3	1	Yes
8LSA66.ee022ffgg-3	1	Yes	8LSA74.ee015ffgg-3	1	Yes	8LSA75.ee020ffgg-3	1	Yes
8LSC66.ee022ffgg-3	1	Yes	8LSA74.ee020ffgg-3	1	Yes	8LSA75.ee022ffgg-3	1	Yes
8LSA66.ee030ffgg-3	1	Yes	8LSC74.ee020ffgg-3	1	Yes	<b>8LSA75.ee030ffgg-3</b>	<b>1</b>	<b>Yes</b>
8LSC66.ee030ffgg-3	1	Yes	8LSA74.ee022ffgg-3	1	Yes	<b>8LSC75.ee030ffgg-3</b>	<b>1.5</b>	<b>No</b>
8LSA66.ee045ffgg-3	1.5	No	8LSC74.ee022ffgg-3	1	Yes	8LSA76.ee015ffgg-3	1.5	No
8LSC66.ee045ffgg-3	1.5	No	8LSA74.ee030ffgg-3	1	Yes	8LSA76.ee030ffgg-3	1.5	No
8LSA73.ee030ffgg-3	1	Yes	8LSC74.ee030ffgg-3	1	Yes	8LSC76.ee030ffgg-3	1.5	No
8LSC73.ee030ffgg-3	1	Yes	8LSA74.ee045ffgg-3	1.5	No			

All other lengths for size 7 and all size 8 motors are equipped with a built-in connector size 1.5, and are therefore not suitable for the single-cable (hybrid) solution.

**2.3.7 Special motor options**

**Reinforced A-side bearing**

8LS three-phase synchronous motors can be delivered with special motor option "Reinforced A-side bearing" depending on the cooling type, size and length: Other special motor options must be arranged with B&R.

The special motor option is listed as part of the model number in the form of a 2-digit code (gg).

When using the reinforced A side bearing option, 8LS motors cannot use the standard holding brake.

A special brake is required when using the "reinforced A side bearing" option.

**Determining the order code for special motor options (gg)**

**Cooling type A**

- 00... No special motor options
- 04... Reinforced A-side bearing

**Cooling type C**

- 00... Special motor option 220 V fan
- 05... No special motor options, standard 24V fan
- 11... Reinforced bearing, standard 24V fan

**Sizes - Overview**

The special motor option "Reinforced A-side bearing" is available for the following sizes:

Special motor option <sup>1)</sup>	Available for motor size						
	2	3	4	5	6	7	8
Reinforced A-side bearing	---	---	Yes	Yes	Yes	Yes	Yes

Table 16: Availability of special motor option "Reinforced A-side bearing"

<sup>1)</sup> The motor option "holding brake" cannot be ordered in combination with special motor option "Reinforced A-side bearing".

## Overview of valid combinations with special motor option "Reinforced A-side bearing"

### Combinations without a brake

Options (ff)	Connectiondirection	Oil seal	Holding brake	Shaft end	Reinforced A side bearing 8LSA (gg) = (04)	Reinforced A side bearing 8LSC (gg) = (11)
<b>C0</b>	Straight (top connector)	No	-	Smooth	Yes	Yes
<b>C1</b>			-	Keyed	Yes	Yes
<b>C6</b>		Yes	-	Smooth	Yes	Yes
<b>C7</b>			-	Keyed	Yes	Yes
<b>D0</b>	Angled (swivel connector)	No	-	Smooth	Yes	Yes
<b>D1</b>			-	Keyed	Yes	Yes
<b>D6</b>		Yes	-	Smooth	Yes	Yes
<b>D7</b>			-	Keyed	Yes	Yes
<b>S0</b>	Angled single-cable solution (hybrid), swivel connector	No	-	Smooth	Yes	Yes
<b>S1</b>			-	Keyed	Yes	Yes
<b>S6</b>		Yes	-	Smooth	Yes	Yes
<b>S7</b>			-	Keyed	Yes	Yes

### Combinations with a brake

Options (ff)	Connectiondirection	Oil seal	Holding brake	Shaft end	Reinforced A side bearing 8LSA (gg) =(04)	Reinforced A side bearing 8LSC (gg) = (11)
<b>CC</b>	Straight (top connector)	No	Special	Smooth	Yes	Yes
<b>CD</b>			Special	Keyed	Yes	Yes
<b>CE</b>		Yes	Special	Smooth	Yes	Yes
<b>CF</b>			Special	Keyed	Yes	Yes
<b>DC</b>	Angled (swivel connector)	No	Special	Smooth	Yes	Yes
<b>DD</b>			Special	Keyed	Yes	Yes
<b>DE</b>		Yes	Special	Smooth	Yes	Yes
<b>DF</b>			Special	Keyed	Yes	Yes
<b>SC</b>	Angled single-cable solution (hybrid), swivel connector	No	Special	Smooth	Yes	Yes
<b>SD</b>			Special	Keyed	Yes	Yes
<b>SE</b>		Yes	Special	Smooth	Yes	Yes
<b>SF</b>			Special	Keyed	Yes	Yes

### Example orders

#### Examples without brake

For an 8LSA55 with D0 encoder with the connection type "single-cable solution, angled (swivel connector)", the following selection is made: no brake, no oil seal, with shaft key. Motor option (ff) = **S1**. A reinforced A-side bearing is also needed. Special motor option (gg) for 8LSA = **04**.

The order code is: **8LSA55.D0030S104-3**

For an 8LSC55 with D0 encoder with the connection type "single-cable solution, angled (swivel connector)", the following selection is made: no brake, no oil seal, with shaft key. Motor option (ff) = **D1**. A reinforced A-side bearing is also needed. Special motor option (gg) for 8LSC = **11**.

The order code is: **8LSC55.D0030S111-3**

#### Examples with special brake for reinforced A-side bearing

For an 8LSA55 with E0 encoder and connection direction angled (swivel connector), a reinforced A-side bearing is needed. Special motor option (gg) for 8LSA = **04**. The following selection is still made: Special brake, no oil seal, with shaft key. Motor option (ff) = **DD**

The order code is: **8LSA55.E0030DD04-3**

For an 8LSC55 with E0 encoder and connection direction angled (swivel connector), a reinforced A-side bearing is needed. Special motor option (gg) for 8LSC = **11**. The following selection is made: no brake, no oil seal, with shaft key. Motor option (ff) = **DD**.

The order code is: **8LSC55.E0030DD11-3**

### Information:

**Motors with special motor option "Reinforced A-side bearing" have increased values (in relation to motors with standard bearings) for the dimensions of the motor shaft, including the total length.**

**The exact dimensions can be found in the motor data for the respective 8LS three-phase synchronous motors.**

### 2.3.7.1 Special brake for "Reinforced A-side bearing" option

8LS three-phase synchronous motors in sizes 4 - 8 are available with Reinforced A-side bearings. A special brake is required for the reinforced bearings and can be ordered.

#### Technical data – Special holding brake for Reinforced A-side bearings

Name	Motor size				
	4	5	6	7	8
Holding torque $M_{Br}$ [Nm]	8	28	28	28	120
Connected load $P_{on}$ [W]	16	26	26	26	50
Supply current $I_{on}$ [A]	0.67	1.08	1.08	1.08	1.51
Supply voltage $U_{on}$ [V]	24	24	24	24	24
Moment of inertia $J_{Br}$ [kgcm <sup>2</sup> ]	1.84	10.2	10.2	10.2	58.9
Mass $m_{Br}$ [kg]	1.55	2.1	2.1	2.1	6

## 2.4 8LS order key

Order Key	8LS	b		d	.	ee	nnn	ff	gg	-	
<b>Cooling type/ construction</b> A...self cooling C...forced cooling (fan)											
<b>Sizes</b> (see section "Sizes") valid values: 2,3,4,5,6,7,8											
<b>Lengths</b> (see section "Lengths") valid values: 2,4,5,6,7,8											
<b>Encoder system</b> (see section "Motor encoder systems")											
<b>For motor size 2</b> R0...Resolver (all versions) E4...opt. EnDat 2.1 singleturn, 512 lines E5...opt. EnDat 2.1 multiturn, 512 lines E8...ind. EnDat 2.1 singleturn, 16 lines E9...ind. EnDat 2.1 multiturn, 16 lines D4...opt. EnDat 2.2 singleturn, 23 bit D5...opt. EnDat 2.2 multiturn, 23 bit S4...opt. EnDat 2.2 singleturn, 23 bit, FS S5...opt. EnDat 2.2 multiturn, 23 bit, FS D8...ind. EnDat 2.2 singleturn, 19 bit D9...ind. EnDat 2.2 multiturn, 19 bit S8...ind. EnDat 2.2 singleturn, 19 bit, FS S9...ind. EnDat 2.2 multiturn, 19 bit,FS											
<b>For motor sizes 3-8</b> R2...Resolver (V3) EA...ind. EnDat 2.1 singleturn, 32 lines EB...ind. EnDat 2.1 multiturn, 32 lines DA...ind. EnDat 2.2 singleturn, 32 lines DB...ind. EnDat 2.2 multiturn, 32 lines SA...ind. EnDat 2.2 singleturn, 32 lines, FS SB...ind. EnDat 2.2 multiturn, 32 lines, FS E0...opt. EnDat 2.1 Singleturn, 512 lines E1...opt. EnDat 2.1 Multiturn, 512 lines D0...opt. EnDat 2.2 single-turn, 31-bit D1...opt. EnDat 2.2 multi-turn, 31-bit S0...opt. EnDat 2.2 single-turn, 31-bit, FS S1...opt. EnDat 2.2 multi-turn, 31-bit, FS											
<b>Nominal speed</b> (see section "Nominal speed") nnn...rated speed/100, e.g. 015 equates a nominal speed of 1500 rpm											
<b>Motor options</b> (see section "Motor options")											
<b>Special motor options</b> (see section "Special motor options")											
<b>For cooling type A</b> 00...No special motor options 04...Reinforced A side bearing <b>For cooling type C</b> 00...Special motor option 230VAC fan 05...No special motor options, standard 24VDC fan 11...Reinforced A side bearing standard 24VDC fan (only for motor sizes 4-8!)											
<b>Motor version</b> Valid value: 3 (value assigned automatically and cannot be chosen freely)											
<b>Other motor options or special motor options must be arranged with B&amp;R</b>											

### 2.4.1 ExampleOrder 1

A three-phase synchronous motor of type **8LSA45** with a nominal speed of 3000 rpm was selected for an application. Because of the construction, the cables can only be connected on the top of the motor ("top" connection direction). The motor should also be equipped with a holding brake, a keyed shaft and a 32-line EnDat single-turn encoder.

The code (ee) for the encoder system is **EA**.

The (nnn) code for a nominal speed of 3000 rpm is **030**.

The code (ff) for the other options (oil seal, holding brake, keyed shaft and connection direction) is **C3**.

The model number for the required motor is **8LSA45.EA030C300-3**

### 2.4.2 ExampleOrder 2

A three-phase synchronous motor of type **8LSA56** with a nominal speed of 4500 rpm was selected for an application. Because of the construction, the cables can only be connected on the back of the motor (swivel connectors), and need to be as compact as possible, so the single-cable (hybrid) solution is desired. The motor should also be equipped with a holding brake, a smooth shaft, an oil seal and a 32-line EnDat multi-turn encoder.

The code (ee) for the encoder system is **EB**.

The code (nnn) for a nominal speed of 4500 rpm is **045**.

The code (ff) for the other options (oil seal, holding brake, smooth shaft end and angled hybrid cable) is **S8**.

Therefore the model number for the motor required is: **8LSA56.EB045S800-3**

## 2.5 General motor data

General information	Cooling / construction type A	Cooling / construction type C
C-UR-US listed	Yes	Yes
UL file number	PRHZ2.E235396	
Electrical characteristics		
Mains input voltage on servo drive	3x 400 VAC ... 3x 480 VAC ±10%	3x 400 VAC ... 3x 480 VAC ±10%
Connection type - Conventional Power connection	speedtec circular connector from Intercontec Size 1 and 1.5	speedtec circular connector from Intercontec Size 1 and 1.5
Encoder connection	Size 1	Size 1
Connection type - Single-cable (hybrid) solution	htec circular connector from Intercontec, size 1	htec circular connector from Intercontec, size 1
Thermal characteristics		
Class of the insulation system in accordance with EN 60034-1	F	F
Methods of cooling in accordance with EN 60034-6 (IC code)	Self-cooling, no separate surface cooling (IC4A0A0)	Externally-cooled; surface cooling with independent cooling module attached (IC4A0A6)
Thermal motor protection in accordance with EN 60034-11	Maximum winding temperature is 155°C (limited by the thermal motor protection in the ACOPOS servo drive or in the ACOPOSmulti drive system to 110°C with EnDat feedback and 130°C with resolver feedback) KTY83-110	Maximum winding temperature is 155°C (limited by the thermal motor protection in the ACOPOS servo drive or in the ACOPOSmulti drive system to 110°C with EnDat feedback and 130°C with resolver feedback) KTY83-110
Mechanical characteristics		
Vibration severity in accordance with EN 60034-14	Vibration severity grade R <sup>1)</sup>	Vibration severity grade R <sup>1)</sup>
Bearing service life calculation	DIN ISO 281	DIN ISO 281
Center hole according to DIN 332	Form F	Form F
Eye bolt according to DIN 580	For size 8	For size 8
Shaft end in accordance with DIN 748 <sup>2)</sup>	Form E	Form E
Oil seal in accordance with DIN 3760	Form A	Form A
Key and keyway in accordance with DIN 6885-1	Form A shaft keys, form N1 keyway	Form A shaft keys, form N1 keyway
Balancing the shaft in accordance with DIN ISO 8821	Half-key arrangement	Half-key arrangement
Mounting flange in accordance with DIN 42948	Form A	Form A
Smooth rotation of shaft end, coaxial properties and mounting flange plane in accordance with DIN 42955	Tolerance R	Tolerance R
Coating Name Color	Water-based coating 98160 *IDROLIN/E SM SEMIOPA-CO NERO RAL 9005-C.452 RAL 9005 flat; shaft end and flange front metallic glossy	Water-based coating 98160 *IDROLIN/E SM SEMIOPA-CO NERO RAL 9005-C.452 RAL 9005 flat; shaft end and flange front metallic glossy

<sup>1)</sup> Valid for all motors with a shaft height greater than 56 mm.

<sup>2)</sup> Except size 2, regular and reinforced bearing in sizes 5, 7 and 8

Operating conditions		
Rating class, operating mode in accordance with EN 60034-1	S1 - Continuous operation	S1 - Continuous operation
Ambient temperature during operation	-15°C to +40°C	-15°C to +40°C
Reduction of the nominal current and stall current at temperatures above 40°C	10% per 10°C	10% per 10°C
Maximum ambient temperature during operation	+55°C <sup>1)</sup>	+55°C <sup>1)</sup>
Reduction of the nominal current and stall current at installation elevations over 1000 m above sea level	10% per 1000 m	10% per 1000 m
Maximum installation elevation	2000 m <sup>2)</sup>	2000 m <sup>2)</sup>
Maximum flange temperature	65°C	65°C
EN 60034-5 protection (IP code)	IP64	IP64, fan IP20
With optional oil seal (DIN 3760)	IP65	IP65, fan IP20
Construction and mounting arrangement type in accordance with EN 60034-7 (IM code)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)

<sup>1)</sup> Continuous operation of the servo motors at ambient temperatures from +40°C to max. +55°C is possible but results in a shorter lifespan.

<sup>2)</sup> Requirements that go beyond this must be arranged with B&R.

Storage and transport conditions		
Storage temperature	-20 to +60°C	-20 to +60°C
Relative humidity during storage	Max. 90%, non-condensing	Max. 90%, non-condensing
Transport temperature	-20 to +60°C	-20 to +60°C
Relative humidity during transport	Max. 90%, non-condensing	Max. 90%, non-condensing

## 2.5.1 Formula symbols

Term	Symbol	Unit	Description
Nominal speed	$n_N$	rpm	Nominal speed of the motor
Nominal torque	$M_N$	Nm	The nominal torque is output by the motor ( $n = n_N$ ) when the nominal current is being drawn. This is possible for any length of time if the environmental conditions are correct.
Nominal power	$P_N$	kW	The nominal power is output by the motor when $n = n_N$ . This is possible for any length of time if the environmental conditions are correct.
Nominal current	$I_N$	A	The nominal current is the RMS value for the phase current (current in the motor supply line) when generating the nominal torque at the nominal speed. This is possible for any length of time if the environmental conditions are correct.
Stall torque	$M_0$	Nm	The stall torque is output by the motor at the speed $n_0$ and when the stall current is being applied. This is possible for any length of time if the environmental conditions are correct. The speed $n_0$ must be high enough so that the winding temperature in all windings is uniform and steady ( $n_0 = 50$ rpm for B&R motors). The continuous torque is reduced when the motor is at a complete standstill.
Stall current	$I_0$	A	The stall current is the RMS value of the phase current (current in the motor supply line) for the generation of the stall torque at the speed $n_0$ . This is possible for any length of time if the environmental conditions are correct. The speed $n_0$ must be high enough so that the winding temperature in all windings is uniform and steady ( $n_0 = 50$ rpm for B&R motors).
Peak torque	$M_{max}$	Nm	The peak torque is briefly output by the motor when the peak current is being drawn.
Peak current	$I_{max}$	A	The peak current is the RMS value of the phase current (current in the motor supply line) for generating the peak torque. This is only possible for a short time. The peak current is determined by the magnetic circuit. Exceeding this value for a short time can cause irreversible damage (demagnetization of the magnet material).
Maximum speed	$n_{max}$	rpm	Maximum motor speed. This is a mechanical condition (centrifugal force, bearing wear).
Average speed	$n_{Avg}$	rpm	Average speed for one cycle
Torque constant	$K_T$	Nm/A	The torque constant determines the torque created by the motor with 1 A rms phase current. This value applies at a motor temperature of 20°C. When the temperature increases, the torque constant is reduced (usually down to 10%). When the current increases, the torque constant is reduced (generally starting at twice the value of the nominal current).
Voltage constant	$K_E$	V/1000 rpm	The voltage constant determines the RMS value (phase-phase) of the counter EMF induced by the motor at a speed of 1000 rpm. This value applies at a motor temperature of 20°C. When the temperature increases, the voltage constant is reduced (usually down to 5%). When the current increases, the voltage constant is reduced (generally starting at twice the value of the nominal current).
Stator resistance	$R_{2ph}$	Ohm	Resistance measured in ohms between two motor leads (phase-phase) at 20°C winding temperature. On B&R motors, the windings use a star connection.
Stator inductance	$L_{2ph}$	mH	Winding inductance measured between two motor leads. Stator inductance depends on the rotor position.
Electrical time constant	$t_{el}$	ms	Corresponds to 1/5 of the time needed for the stator current to stabilize with constant operating conditions.
Thermal time constant	$t_{therm}$	min	Corresponds to 1/5 of the time needed for the motor temperature to stabilize with constant operating conditions.
Moment of inertia without brake	$J$	kgcm <sup>2</sup>	Moment of inertia for a motor without a holding brake
Mass without brake	$m$	kg	Mass of motor without holding brake
Moment of inertia of brake	$J_{Br}$	kgcm <sup>2</sup>	Moment of inertia for the built-in holding brake
Brake mass	$m_{Br}$	kg	Mass of built-in holding brake
Brake holding torque	$M_{Br}$	Nm	Minimum torque required to hold the rotor when the brake is activated
Installed load	$P_{on}$	W	Installed load for the built-in holding brake
Installed current	$I_{on}$	A	Installed current for the built-in holding brake
Connection voltage	$U_{on}$	V	Operating voltage for the built-in holding brake
Activation delay	$t_{on}$	ms	Delay time required for the holding torque of the brake to be established after the operating voltage has been removed from the holding brake
Release delay	$t_{off}$	ms	Delay time required until the holding torque of the holding brake is reduced by 90% (the brake is released) after operating voltage has been returned to the holding brake

## 2.5.2 Power loss

Heat from the servo motors is dissipated via the motor flange and the surface of the motor. The following factors are important to ensure optimal heat dissipation:

- Thermally open installation
- Free convection

The motor data specified for the nominal operating point apply to a motor installed in a thermally open system. The dimensions of the flange plates used for measurement can be found in the following table.

Generally speaking: the larger the flange, the better the heat dissipation.

Size	Dimensions [mm]	Material
8LSx2, 8LSx3	250x250x6	Aluminum
8LSx4, 8LSx5	350x350x12	Aluminum
8LSx6, 8LSx7	495x495x15	Aluminum
8LSx8	Ø450x20	Steel



## 2.6 Standard motors - Technical data

Model number	8LSA25. R0060D000-3	8LSA25. R0060D100-3	8LSA25. R0060D200-3	8LSA25. R0060D300-3	8LSA25. D8060S000-3	8LSA25. D8060S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]				6000		
Number of pole pairs				4		
Nominal torque $M_N$ [Nm]				0.52		
Nominal power $P_N$ [W]				327		
Nominal current $I_N$ [A]				0.71		
Stall torque $M_0$ [Nm]				0.6		
Stall current $I_0$ [A]				0.82		
Maximum torque $M_{max}$ [Nm]				2.4		
Maximum current $I_{max}$ [A]				3.7		
Maximum speed $n_{max}$ [rpm]				9000		
Torque constant $K_T$ [Nm/A]				0.73		
Voltage constant $K_E$ [V/1000 rpm]				43.98		
Stator resistance $R_{2ph}$ [ $\Omega$ ]				34.63		
Stator inductance $L_{2ph}$ [mH]				49.6		
Electrical time constant $t_{el}$ [ms]				1.4		
Thermal time constant $t_{therm}$ [min]				20		
Moment of inertia $J$ [kgcm <sup>2</sup> ]				0.16		
Mass without brake $m$ [kg]				1.3		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]				2.2		
Brake mass [kg]				0.45		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]				0.12		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...				1010		
ACOPOSmulti inverter module 8BVlxxxx...				0014		
Cross section for B&R motor cables [mm <sup>2</sup> ]				0.75		
Connector type				speedtec		
Connector size				1.0		
<b>Options</b>						
Connection type	Male connector			Single-cable solution		
Connection direction	Angled (swivel connector)			Swivel, SCS		
Encoder	R0 Resolver 2-pin			D8 2.2 inductive single-turn		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 17: 8LSA25.R0060D000-3, 8LSA25.R0060D100-3, 8LSA25.R0060D200-3, 8LSA25.R0060D300-3, 8LSA25.D8060S000-3, 8LSA25.D8060S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA25. D8060S200-3	8LSA25. D8060S300-3	8LSA25. D9060S000-3	8LSA25. D9060S100-3	8LSA25. D9060S200-3	8LSA25. D9060S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000					
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	0.52					
Nominal power $P_N$ [W]	327					
Nominal current $I_N$ [A]	0.71					
Stall torque $M_0$ [Nm]	0.6					
Stall current $I_0$ [A]	0.82					
Maximum torque $M_{max}$ [Nm]	2.4					
Maximum current $I_{max}$ [A]	3.7					
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	0.73					
Voltage constant $K_E$ [V/1000 rpm]	43.98					
Stator resistance $R_{zph}$ [ $\Omega$ ]	34.63					
Stator inductance $L_{zph}$ [mH]	49.6					
Electrical time constant $t_{el}$ [ms]	1.4					
Thermal time constant $t_{therm}$ [min]	20					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	0.16					
Mass without brake $m$ [kg]	1.3					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	2.2					
Brake mass [kg]	0.45					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.12					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1010					
ACOPOSmulti inverter module 8BVxxxx...	0014					
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	D8 2.2 inductive single-turn			D9 2.2 inductive multi-turn		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 18: 8LSA25.D8060S200-3, 8LSA25.D8060S300-3, 8LSA25.D9060S000-3, 8LSA25.D9060S100-3, 8LSA25.D9060S200-3, 8LSA25.D9060S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA35. R2030D000-3	8LSA35. R2030D100-3	8LSA35. R2030D200-3	8LSA35. R2030D300-3	8LSA35. R2060D000-3	8LSA35. R2060D100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000			6000		
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	2.1			1.6		
Nominal power $P_N$ [W]	660			1005		
Nominal current $I_N$ [A]	1.4			2.2		
Stall torque $M_0$ [Nm]	2.3			2.3		
Stall current $I_0$ [A]	1.6			3.2		
Maximum torque $M_{max}$ [Nm]	9.2			9.2		
Maximum current $I_{max}$ [A]	6.8			13.6		
Maximum speed $n_{max}$ [rpm]	9000			9000		
Torque constant $K_T$ [Nm/A]	1.45			0.73		
Voltage constant $K_E$ [V/1000 rpm]	87.96			43.98		
Stator resistance $R_{zph}$ [ $\Omega$ ]	12.22			3.02		
Stator inductance $L_{zph}$ [mH]	63			15.6		
Electrical time constant $t_{el}$ [ms]	5.2			5.1		
Thermal time constant $t_{therm}$ [min]	34			34		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	0.9			0.9		
Mass without brake $m$ [kg]	4.4			4.4		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	4			4		
Brake mass [kg]	1.09			1.09		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38			0.38		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1022			1045		
ACOPOS multi inverter module 8BVxxxx...	0014			0028		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector					
Connection direction	Angled (swivel connector)					
Encoder	R2 resolver 2-pin					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 19: 8LSA35.R2030D000-3, 8LSA35.R2030D100-3, 8LSA35.R2030D200-3, 8LSA35.R2030D300-3, 8LSA35.R2060D000-3, 8LSA35.R2060D100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA35. R2060D200-3	8LSA35. R2060D300-3	8LSA35. DA030S000-3	8LSA35. DA030S100-3	8LSA35. DA030S200-3	8LSA35. DA030S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000		3000			
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	1.6		2.1			
Nominal power $P_N$ [W]	1005		660			
Nominal current $I_N$ [A]	2.2		1.4			
Stall torque $M_0$ [Nm]			2.3			
Stall current $I_0$ [A]	3.2		1.6			
Maximum torque $M_{max}$ [Nm]			9.2			
Maximum current $I_{max}$ [A]	13.6		6.8			
Maximum speed $n_{max}$ [rpm]			9000			
Torque constant $K_T$ [Nm/A]	0.73		1.45			
Voltage constant $K_E$ [V/1000 rpm]	43.98		87.96			
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.02		12.22			
Stator inductance $L_{zph}$ [mH]	15.6		63			
Electrical time constant $t_{el}$ [ms]	5.1		5.2			
Thermal time constant $t_{therm}$ [min]			34			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			0.9			
Mass without brake $m$ [kg]			4.4			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			4			
Brake mass [kg]			1.09			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.38			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045		1022			
ACOPOS multi inverter module 8BVxxxx...	0028		0014			
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector		Single-cable solution			
Connection direction	Angled (swivel connector)		Swivel, SCS			
Encoder	R2 resolver 2-pin		DA 2.2 inductive 32-line single-turn			
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 20: 8LSA35.R2060D200-3, 8LSA35.R2060D300-3, 8LSA35.DA030S000-3, 8LSA35.DA030S100-3, 8LSA35.DA030S200-3, 8LSA35.DA030S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA35. DA060S000-3	8LSA35. DA060S100-3	8LSA35. DA060S200-3	8LSA35. DA060S300-3	8LSA35. DB030S000-3	8LSA35. DB030S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000			3000		
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	1.6			2.1		
Nominal power $P_N$ [W]	1005			660		
Nominal current $I_N$ [A]	2.2			1.4		
Stall torque $M_0$ [Nm]	2.3			1.6		
Stall current $I_0$ [A]	3.2			6.8		
Maximum torque $M_{max}$ [Nm]	9.2			1.45		
Maximum current $I_{max}$ [A]	13.6			87.96		
Maximum speed $n_{max}$ [rpm]	9000			12.22		
Torque constant $K_T$ [Nm/A]	0.73			63		
Voltage constant $K_E$ [V/1000 rpm]	43.98			5.2		
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.02			34		
Stator inductance $L_{zph}$ [mH]	15.6			0.9		
Electrical time constant $t_{el}$ [ms]	5.1			4.4		
Thermal time constant $t_{therm}$ [min]	34			0.9		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	0.9			4.4		
Mass without brake $m$ [kg]	4.4			0.38		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	4			1.09		
Brake mass [kg]	1.09			0.38		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38			0.75		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045			1022		
ACOPOS multi inverter module 8BVxxxx...	0028			0014		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75			speedtec		
Connector type	speedtec			1.0		
Connector size	1.0			Single-cable solution		
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn			DB 2.2 inductive 32-line multi-turn		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 21: 8LSA35.DA060S000-3, 8LSA35.DA060S100-3, 8LSA35.DA060S200-3, 8LSA35.DA060S300-3, 8LSA35.DB030S000-3, 8LSA35.DB030S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA35. DB030S200-3	8LSA35. DB030S300-3	8LSA35. DB060S000-3	8LSA35. DB060S100-3	8LSA35. DB060S200-3	8LSA35. DB060S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000		6000			
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	2.1		1.6			
Nominal power $P_N$ [W]	660		1005			
Nominal current $I_N$ [A]	1.4		2.2			
Stall torque $M_0$ [Nm]			2.3			
Stall current $I_0$ [A]	1.6		3.2			
Maximum torque $M_{max}$ [Nm]			9.2			
Maximum current $I_{max}$ [A]	6.8		13.6			
Maximum speed $n_{max}$ [rpm]			9000			
Torque constant $K_T$ [Nm/A]	1.45		0.73			
Voltage constant $K_E$ [V/1000 rpm]	87.96		43.98			
Stator resistance $R_{zph}$ [ $\Omega$ ]	12.22		3.02			
Stator inductance $L_{zph}$ [mH]	63		15.6			
Electrical time constant $t_{el}$ [ms]	5.2		5.1			
Thermal time constant $t_{therm}$ [min]			34			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			0.9			
Mass without brake $m$ [kg]			4.4			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			4			
Brake mass [kg]			1.09			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.38			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1022				1045	
ACOPOS multi inverter module 8BVxxxx...	0014				0028	
Cross section for B&R motor cables [mm <sup>2</sup> ]			0.75			
Connector type			speedtec			
Connector size			1.0			
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DB 2.2 inductive 32-line multi-turn					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 22: 8LSA35.DB030S200-3, 8LSA35.DB030S300-3, 8LSA35.DB060S000-3, 8LSA35.DB060S100-3, 8LSA35.DB060S200-3, 8LSA35.DB060S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA35. EA030D000-3	8LSA35. EA030D200-3	8LSA35. EA060D000-3	8LSA35. EA060D200-3	8LSA35. EB030D000-3	8LSA35. EB030D200-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000		6000		3000	
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	2.1		1.6		2.1	
Nominal power $P_N$ [W]	660		1005		660	
Nominal current $I_N$ [A]	1.4		2.2		1.4	
Stall torque $M_0$ [Nm]			2.3			
Stall current $I_0$ [A]	1.6		3.2		1.6	
Maximum torque $M_{max}$ [Nm]			9.2			
Maximum current $I_{max}$ [A]	6.8		13.6		6.8	
Maximum speed $n_{max}$ [rpm]			9000			
Torque constant $K_T$ [Nm/A]	1.45		0.73		1.45	
Voltage constant $K_E$ [V/1000 rpm]	87.96		43.98		87.96	
Stator resistance $R_{zph}$ [ $\Omega$ ]	12.22		3.02		12.22	
Stator inductance $L_{zph}$ [mH]	63		15.6		63	
Electrical time constant $t_{el}$ [ms]	5.2		5.1		5.2	
Thermal time constant $t_{therm}$ [min]			34			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			0.9			
Mass without brake $m$ [kg]			4.4			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			4			
Brake mass [kg]			1.09			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.38			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...	1022		1045		1022	
ACOPOS multi inverter module 8BVlxxx...	0014		0028		0014	
Cross section for B&R motor cables [mm <sup>2</sup> ]			0.75			
Connector type			speedtec			
Connector size			1.0			
<b>Options</b>						
Connection type			Male connector			
Connection direction			Angled (swivel connector)			
Encoder			EA inductive 32-line single-turn V2		EB inductive 32-line multi-turn V2	
Shaft end			Smooth shaft			

Table 23: 8LSA35.EA030D000-3, 8LSA35.EA030D200-3, 8LSA35.EA060D000-3, 8LSA35.EA060D200-3, 8LSA35.EB030D000-3, 8LSA35.EB030D200-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA35. EB060D000-3	8LSA35. EB060D200-3	8LSA37. R2030D000-3	8LSA37. R2030D100-3	8LSA37. R2030D200-3	8LSA37. R2030D300-3	
<b>Motor</b>							
Nominal speed $n_N$ [rpm]	6000		3000				
Number of pole pairs	4						
Nominal torque $M_N$ [Nm]	1.6		3.4				
Nominal power $P_N$ [W]	1005		1068				
Nominal current $I_N$ [A]	2.2		2.3				
Stall torque $M_0$ [Nm]	2.3		3.6				
Stall current $I_0$ [A]	3.2		2.5				
Maximum torque $M_{max}$ [Nm]	9.2		14.4				
Maximum current $I_{max}$ [A]	13.6		10.6				
Maximum speed $n_{max}$ [rpm]	9000						
Torque constant $K_T$ [Nm/A]	0.73		1.45				
Voltage constant $K_E$ [V/1000 rpm]	43.98		87.96				
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.02		6.98				
Stator inductance $L_{zph}$ [mH]	15.6		37.5				
Electrical time constant $t_{el}$ [ms]	5.1		5.4				
Thermal time constant $t_{therm}$ [min]	34		38				
Moment of inertia $J$ [kgcm <sup>2</sup> ]	0.9		1.38				
Mass without brake $m$ [kg]	4.4		5.6				
<b>Holding brake</b>							
Holding torque of the brake $M_{Br}$ [Nm]	4						
Brake mass [kg]	1.09		0.59				
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38						
<b>Recommendations</b>							
ACOPOS servo drive 8Vxxxx.xx...	1045						
ACOPOS multi inverter module 8BVxxxx...	0028						
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75						
Connector type	speedtec						
Connector size	1.0						
<b>Options</b>							
Connection type	Male connector						
Connection direction	Angled (swivel connector)						
Encoder	EB inductive 32-line multi-turn V2		R2 resolver 2-pin				
Shaft end	Smooth shaft			Keyed shaft		Smooth shaft    Keyed shaft	

Table 24: 8LSA35.EB060D000-3, 8LSA35.EB060D200-3, 8LSA37.R2030D000-3, 8LSA37.R2030D100-3, 8LSA37.R2030D200-3, 8LSA37.R2030D300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.



Model number	8LSA37. R2060D000-3	8LSA37. R2060D100-3	8LSA37. R2060D200-3	8LSA37. R2060D300-3	8LSA37. DA030S000-3	8LSA37. DA030S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000			3000		
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	2			3.4		
Nominal power $P_N$ [W]	1257			1068		
Nominal current $I_N$ [A]	2.7			2.3		
Stall torque $M_0$ [Nm]	3.6					
Stall current $I_0$ [A]	4.9			2.5		
Maximum torque $M_{max}$ [Nm]	14.4					
Maximum current $I_{max}$ [A]	21.2			10.6		
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	0.73			1.45		
Voltage constant $K_E$ [V/1000 rpm]	43.98			87.96		
Stator resistance $R_{zph}$ [ $\Omega$ ]	1.76			6.98		
Stator inductance $L_{zph}$ [mH]	9.6			37.5		
Electrical time constant $t_{el}$ [ms]	5.5			5.4		
Thermal time constant $t_{therm}$ [min]	38					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	1.38					
Mass without brake $m$ [kg]	5.6					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	4					
Brake mass [kg]	0.59					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090			1045		
ACOPOS multi inverter module 8BVlxxxx...	0055			0028		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector			Single-cable solution		
Connection direction	Angled (swivel connector)			Swivel, SCS		
Encoder	R2 resolver 2-pin			DA 2.2 inductive 32-line single-turn		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 25: 8LSA37.R2060D000-3, 8LSA37.R2060D100-3, 8LSA37.R2060D200-3, 8LSA37.R2060D300-3, 8LSA37.DA030S000-3, 8LSA37.DA030S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA37. DA030S200-3	8LSA37. DA030S300-3	8LSA37. DB030S000-3	8LSA37. DB030S100-3	8LSA37. DB030S200-3	8LSA37. DB030S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000					
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	3.4					
Nominal power $P_N$ [W]	1068					
Nominal current $I_N$ [A]	2.3					
Stall torque $M_0$ [Nm]	3.6					
Stall current $I_0$ [A]	2.5					
Maximum torque $M_{max}$ [Nm]	14.4					
Maximum current $I_{max}$ [A]	10.6					
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	1.45					
Voltage constant $K_E$ [V/1000 rpm]	87.96					
Stator resistance $R_{zph}$ [ $\Omega$ ]	6.98					
Stator inductance $L_{zph}$ [mH]	37.5					
Electrical time constant $t_{el}$ [ms]	5.4					
Thermal time constant $t_{therm}$ [min]	38					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	1.38					
Mass without brake $m$ [kg]	5.6					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	4					
Brake mass [kg]	0.59					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045					
ACOPOS multi inverter module 8BVxxxx...	0028					
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn			DB 2.2 inductive 32-line multi-turn		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 26: 8LSA37.DA030S200-3, 8LSA37.DA030S300-3, 8LSA37.DB030S000-3, 8LSA37.DB030S100-3, 8LSA37.DB030S200-3, 8LSA37.DB030S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA37. DB060S000-3	8LSA37. DB060S100-3	8LSA37. DB060S200-3	8LSA37. DB060S300-3	8LSA44. R2030D000-3	8LSA44. R2030D100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000			3000		
Number of pole pairs	4			5		
Nominal torque $M_N$ [Nm]	2			4.62		
Nominal power $P_N$ [W]	1257			1451		
Nominal current $I_N$ [A]	2.7			2.8		
Stall torque $M_0$ [Nm]	3.6			6		
Stall current $I_0$ [A]	4.9			3.7		
Maximum torque $M_{max}$ [Nm]	14.4			22.8		
Maximum current $I_{max}$ [A]	21.2			21.9		
Maximum speed $n_{max}$ [rpm]	9000			12000		
Torque constant $K_T$ [Nm/A]	0.73			1.63		
Voltage constant $K_E$ [V/1000 rpm]	43.98			98.4		
Stator resistance $R_{zph}$ [ $\Omega$ ]	1.76			3.6		
Stator inductance $L_{zph}$ [mH]	9.6			24		
Electrical time constant $t_{el}$ [ms]	5.5			6.7		
Thermal time constant $t_{therm}$ [min]	38			30		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	1.38			2.73		
Mass without brake $m$ [kg]	5.6			5.4		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	4			8		
Brake mass [kg]	0.59			1		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38			0.54		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090			1045		
ACOPOS multi inverter module 8BVxxxx...				0055		
Cross section for B&R motor cables [mm <sup>2</sup> ]				0.75		
Connector type				speedtec		
Connector size				1.0		
<b>Options</b>						
Connection type	Single-cable solution			Male connector		
Connection direction	Swivel, SCS			Angled (swivel connector)		
Encoder	DB 2.2 inductive 32-line multi-turn			R2 resolver 2-pin		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 27: 8LSA37.DB060S000-3, 8LSA37.DB060S100-3, 8LSA37.DB060S200-3, 8LSA37.DB060S300-3, 8LSA44.R2030D000-3, 8LSA44.R2030D100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA44. R2030D200-3	8LSA44. R2030D300-3	8LSA44. R2060D000-3	8LSA44. R2060D100-3	8LSA44. R2060D200-3	8LSA44. R2060D300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000		6000			
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	4.62		3			
Nominal power $P_N$ [W]	1451		1885			
Nominal current $I_N$ [A]	2.8		3.7			
Stall torque $M_0$ [Nm]			6			
Stall current $I_0$ [A]	3.7		7.4			
Maximum torque $M_{max}$ [Nm]			22.8			
Maximum current $I_{max}$ [A]	21.9		43.8			
Maximum speed $n_{max}$ [rpm]			12000			
Torque constant $K_T$ [Nm/A]	1.63		0.81			
Voltage constant $K_E$ [V/1000 rpm]	98.4		49.2			
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.6		0.862			
Stator inductance $L_{zph}$ [mH]	24		6.2			
Electrical time constant $t_{el}$ [ms]	6.7		7.2			
Thermal time constant $t_{therm}$ [min]			30			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			2.73			
Mass without brake $m$ [kg]			5.4			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			8			
Brake mass [kg]			1			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.54			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045		1090			
ACOPOS multi inverter module 8BVxxxx...	0055		0110			
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector					
Connection direction	Angled (swivel connector)					
Encoder	R2 resolver 2-pin					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 28: 8LSA44.R2030D200-3, 8LSA44.R2030D300-3, 8LSA44.R2060D000-3, 8LSA44.R2060D100-3, 8LSA44.R2060D200-3, 8LSA44.R2060D300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA44. DA030S000-3	8LSA44. DA030S100-3	8LSA44. DA030S200-3	8LSA44. DA030S300-3	8LSA44. DA060S000-3	8LSA44. DA060S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000			6000		
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	4.62			3		
Nominal power $P_N$ [W]	1451			1885		
Nominal current $I_N$ [A]	2.8			3.7		
Stall torque $M_0$ [Nm]	6					
Stall current $I_0$ [A]	3.7			7.4		
Maximum torque $M_{max}$ [Nm]	22.8					
Maximum current $I_{max}$ [A]	21.9			43.8		
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	1.63			0.81		
Voltage constant $K_E$ [V/1000 rpm]	98.4			49.2		
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.6			0.862		
Stator inductance $L_{zph}$ [mH]	24			6.2		
Electrical time constant $t_{el}$ [ms]	6.7			7.2		
Thermal time constant $t_{therm}$ [min]	30					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73					
Mass without brake $m$ [kg]	5.4					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...	1045			1090		
ACOPOS multi inverter module 8BVlxxx...	0055			0110		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 29: 8LSA44.DA030S000-3, 8LSA44.DA030S100-3, 8LSA44.DA030S200-3, 8LSA44.DA030S300-3, 8LSA44.DA060S000-3, 8LSA44.DA060S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA44. DA060S200-3	8LSA44. DA060S300-3	8LSA44. EA030D000-3	8LSA44. EA030D200-3	8LSA44. EA060D000-3	8LSA44. EA060D200-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000		3000		6000	
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	3		4.62		3	
Nominal power $P_N$ [W]	1885		1451		1885	
Nominal current $I_N$ [A]	3.7		2.8		3.7	
Stall torque $M_0$ [Nm]	6					
Stall current $I_0$ [A]	7.4		3.7		7.4	
Maximum torque $M_{max}$ [Nm]	22.8					
Maximum current $I_{max}$ [A]	43.8		21.9		43.8	
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	0.81		1.63		0.81	
Voltage constant $K_E$ [V/1000 rpm]	49.2		98.4		49.2	
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.862		3.6		0.862	
Stator inductance $L_{zph}$ [mH]	6.2		24		6.2	
Electrical time constant $t_{el}$ [ms]	7.2		6.7		7.2	
Thermal time constant $t_{therm}$ [min]	30					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73					
Mass without brake $m$ [kg]	5.4					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...	1090		1045		1090	
ACOPOS multi inverter module 8BVlxxx...	0110		0055		0110	
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution			Male connector		
Connection direction	Swivel, SCS			Angled (swivel connector)		
Encoder	DA 2.2 inductive 32-line single-turn			EA inductive 32-line single-turn V2		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft			

Table 30: 8LSA44.DA060S200-3, 8LSA44.DA060S300-3, 8LSA44.EA030D000-3, 8LSA44.EA030D200-3, 8LSA44.EA060D000-3, 8LSA44.EA060D200-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA44. EB030D000-3	8LSA44. EB030D200-3	8LSA44. EB060D000-3	8LSA44. EB060D200-0	8LSA44. R2030D000-3	8LSA44. R2030D100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000		6000		3000	
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	4.62		3		4.62	
Nominal power $P_N$ [W]	1451		1885		1451	
Nominal current $I_N$ [A]	2.8		3.7	3.68	2.8	
Stall torque $M_0$ [Nm]	6					
Stall current $I_0$ [A]	3.7		7.4		3.7	
Maximum torque $M_{max}$ [Nm]	22.8					
Maximum current $I_{max}$ [A]	21.9		43.8	43.76	21.9	
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	1.63		0.81		1.63	
Voltage constant $K_E$ [V/1000 rpm]	98.4		49.2		98.4	
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.6		0.862	0.86	3.6	
Stator inductance $L_{zph}$ [mH]	24		6.2		24	
Electrical time constant $t_{el}$ [ms]	6.7		7.2	7.19	6.7	
Thermal time constant $t_{therm}$ [min]	30					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73					
Mass without brake $m$ [kg]	5.4					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1		0.46		1	
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045		1090		1045	
ACOPOS multi inverter module 8BVxxxx...	0055		0110		0055	
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75		1.5		0.75	
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector					
Connection direction	Angled (swivel connector)					
Encoder	EB inductive 32-line multi-turn V2			R2 resolver 2-pin		
Shaft end	Smooth shaft				Keyed shaft	

Table 31: 8LSA44.EB030D000-3, 8LSA44.EB030D200-3, 8LSA44.EB060D000-3, 8LSA44.EB060D200-0, 8LSA44.R2030D000-3, 8LSA44.R2030D100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA44. R2030D200-3	8LSA44. R2030D300-3	8LSA44. R2060D000-3	8LSA44. R2060D100-3	8LSA44. R2060D200-3	8LSA44. R2060D300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000		6000			
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	4.62		3			
Nominal power $P_N$ [W]	1451		1885			
Nominal current $I_N$ [A]	2.8		3.7			
Stall torque $M_0$ [Nm]			6			
Stall current $I_0$ [A]	3.7		7.4			
Maximum torque $M_{max}$ [Nm]			22.8			
Maximum current $I_{max}$ [A]	21.9		43.8			
Maximum speed $n_{max}$ [rpm]			12000			
Torque constant $K_T$ [Nm/A]	1.63		0.81			
Voltage constant $K_E$ [V/1000 rpm]	98.4		49.2			
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.6		0.862			
Stator inductance $L_{zph}$ [mH]	24		6.2			
Electrical time constant $t_{el}$ [ms]	6.7		7.2			
Thermal time constant $t_{therm}$ [min]			30			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			2.73			
Mass without brake $m$ [kg]			5.4			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			8			
Brake mass [kg]			1			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.54			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045		1090			
ACOPOS multi inverter module 8BVxxxx...	0055		0110			
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector					
Connection direction	Angled (swivel connector)					
Encoder	R2 resolver 2-pin					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 32: 8LSA44.R2030D200-3, 8LSA44.R2030D300-3, 8LSA44.R2060D000-3, 8LSA44.R2060D100-3, 8LSA44.R2060D200-3, 8LSA44.R2060D300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.



Model number	8LSA44. DA030S000-3	8LSA44. DA030S100-3	8LSA44. DA030S200-3	8LSA44. DA030S300-3	8LSA44. DA060S000-3	8LSA44. DA060S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000			6000		
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	4.62			3		
Nominal power $P_N$ [W]	1451			1885		
Nominal current $I_N$ [A]	2.8			3.7		
Stall torque $M_0$ [Nm]	6					
Stall current $I_0$ [A]	3.7			7.4		
Maximum torque $M_{max}$ [Nm]	22.8					
Maximum current $I_{max}$ [A]	21.9			43.8		
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	1.63			0.81		
Voltage constant $K_E$ [V/1000 rpm]	98.4			49.2		
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.6			0.862		
Stator inductance $L_{zph}$ [mH]	24			6.2		
Electrical time constant $t_{el}$ [ms]	6.7			7.2		
Thermal time constant $t_{therm}$ [min]	30					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73					
Mass without brake $m$ [kg]	5.4					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045			1090		
ACOPOS multi inverter module 8BVlxxxx...	0055			0110		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 33: 8LSA44.DA030S000-3, 8LSA44.DA030S100-3, 8LSA44.DA030S200-3, 8LSA44.DA030S300-3, 8LSA44.DA060S000-3, 8LSA44.DA060S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA44. DA060S200-3	8LSA44. DA060S300-3	8LSA44. DB030S000-3	8LSA44. DB030S100-3	8LSA44. DB030S200-3	8LSA44. DB030S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000		3000			
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	3		4.62			
Nominal power $P_N$ [W]	1885		1451			
Nominal current $I_N$ [A]	3.7		2.8			
Stall torque $M_0$ [Nm]			6			
Stall current $I_0$ [A]	7.4		3.7			
Maximum torque $M_{max}$ [Nm]			22.8			
Maximum current $I_{max}$ [A]	43.8		21.9			
Maximum speed $n_{max}$ [rpm]			12000			
Torque constant $K_T$ [Nm/A]	0.81		1.63			
Voltage constant $K_E$ [V/1000 rpm]	49.2		98.4			
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.862		3.6			
Stator inductance $L_{zph}$ [mH]	6.2		24			
Electrical time constant $t_{el}$ [ms]	7.2		6.7			
Thermal time constant $t_{therm}$ [min]			30			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			2.73			
Mass without brake $m$ [kg]			5.4			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			8			
Brake mass [kg]			1			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.54			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090		1045			
ACOPOS multi inverter module 8BVxxxx...	0110		0055			
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn		DB 2.2 inductive 32-line multi-turn			
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 34: 8LSA44.DA060S200-3, 8LSA44.DA060S300-3, 8LSA44.DB030S000-3, 8LSA44.DB030S100-3, 8LSA44.DB030S200-3, 8LSA44.DB030S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA44. DB060S000-3	8LSA44. DB060S100-3	8LSA44. DB060S200-3	8LSA44. DB060S300-3	8LSA44. EA030D000-3	8LSA44. EA030D200-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000			3000		
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	3			4.62		
Nominal power $P_N$ [W]	1885			1451		
Nominal current $I_N$ [A]	3.7			2.8		
Stall torque $M_0$ [Nm]	6					
Stall current $I_0$ [A]	7.4			3.7		
Maximum torque $M_{max}$ [Nm]	22.8					
Maximum current $I_{max}$ [A]	43.8			21.9		
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	0.81			1.63		
Voltage constant $K_E$ [V/1000 rpm]	49.2			98.4		
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.862			3.6		
Stator inductance $L_{zph}$ [mH]	6.2			24		
Electrical time constant $t_{el}$ [ms]	7.2			6.7		
Thermal time constant $t_{therm}$ [min]	30					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73					
Mass without brake $m$ [kg]	5.4					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090			1045		
ACOPOS multi inverter module 8BVxxxx...	0110			0055		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution			Male connector		
Connection direction	Swivel, SCS			Angled (swivel connector)		
Encoder	DB 2.2 inductive 32-line multi-turn			EA inductive 32-line single-turn V2		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	

Table 35: 8LSA44.DB060S000-3, 8LSA44.DB060S100-3, 8LSA44.DB060S200-3, 8LSA44.DB060S300-3, 8LSA44.EA030D000-3, 8LSA44.EA030D200-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA44. EA060D000-3	8LSA44. EA060D200-3	8LSA44. EB030D000-3	8LSA44. EB030D200-3	8LSA44. EB060D000-3	8LSA44. EB060D200-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000		3000		6000	
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	3		4.62		3	
Nominal power $P_N$ [W]	1885		1451		1885	
Nominal current $I_N$ [A]	3.7		2.8		3.7	
Stall torque $M_0$ [Nm]	6					
Stall current $I_0$ [A]	7.4		3.7		7.4	
Maximum torque $M_{max}$ [Nm]	22.8					
Maximum current $I_{max}$ [A]	43.8		21.9		43.8	
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	0.81		1.63		0.81	
Voltage constant $K_E$ [V/1000 rpm]	49.2		98.4		49.2	
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.862		3.6		0.862	
Stator inductance $L_{zph}$ [mH]	6.2		24		6.2	
Electrical time constant $t_{el}$ [ms]	7.2		6.7		7.2	
Thermal time constant $t_{therm}$ [min]	30					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73					
Mass without brake $m$ [kg]	5.4					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...	1090		1045		1090	
ACOPOS multi inverter module 8BVlxxx...	0110		0055		0110	
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector					
Connection direction	Angled (swivel connector)					
Encoder	EA inductive 32-line single-turn V2		EB inductive 32-line multi-turn V2			
Shaft end	Smooth shaft					

Table 36: 8LSA44.EA060D000-3, 8LSA44.EA060D200-3, 8LSA44.EB030D000-3, 8LSA44.EB030D200-3, 8LSA44.EB060D000-3, 8LSA44.EB060D200-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA46. R2030D000-3	8LSA46. R2030D100-3	8LSA46. R2030D200-3	8LSA46. R2030D300-3	8LSA46. R2060D000-3	8LSA46. R2060D100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000			6000		
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	7.7			5		
Nominal power $P_N$ [W]	2419			3142		
Nominal current $I_N$ [A]	4.7			6.1		
Stall torque $M_0$ [Nm]	10					
Stall current $I_0$ [A]	6.1			12.3		
Maximum torque $M_{max}$ [Nm]	38					
Maximum current $I_{max}$ [A]	36.5			72.9		
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	1.63			0.81		
Voltage constant $K_E$ [V/1000 rpm]	98.4			49.2		
Stator resistance $R_{zph}$ [ $\Omega$ ]	1.92			0.48		
Stator inductance $L_{zph}$ [mH]	17.44			4.36		
Electrical time constant $t_{el}$ [ms]	9.1					
Thermal time constant $t_{therm}$ [min]	40					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	4.39					
Mass without brake $m$ [kg]	7.3					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...	1090			1180		
ACOPOS multi inverter module 8BVlxxx...	0055			0110		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75			1.5		
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector					
Connection direction	Angled (swivel connector)					
Encoder	R2 resolver 2-pin					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 37: 8LSA46.R2030D000-3, 8LSA46.R2030D100-3, 8LSA46.R2030D200-3, 8LSA46.R2030D300-3, 8LSA46.R2060D000-3, 8LSA46.R2060D100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA46. R2060D200-3	8LSA46. R2060D300-3	8LSA46. DA030S000-3	8LSA46. DA030S100-3	8LSA46. DA030S200-3	8LSA46. DA030S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000		3000			
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	5		7.7			
Nominal power $P_N$ [W]	3142		2419			
Nominal current $I_N$ [A]	6.1		4.7			
Stall torque $M_0$ [Nm]			10			
Stall current $I_0$ [A]	12.3		6.1			
Maximum torque $M_{max}$ [Nm]			38			
Maximum current $I_{max}$ [A]	72.9		36.5			
Maximum speed $n_{max}$ [rpm]			12000			
Torque constant $K_T$ [Nm/A]	0.81		1.63			
Voltage constant $K_E$ [V/1000 rpm]	49.2		98.4			
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.48		1.92			
Stator inductance $L_{zph}$ [mH]	4.36		17.44			
Electrical time constant $t_{el}$ [ms]			9.1			
Thermal time constant $t_{therm}$ [min]			40			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			4.39			
Mass without brake $m$ [kg]			7.3			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			8			
Brake mass [kg]			1			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.54			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180		1090			
ACOPOS multi inverter module 8BVxxxx...	0110		0055			
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5		0.75			
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector		Single-cable solution			
Connection direction	Angled (swivel connector)		Swivel, SCS			
Encoder	R2 resolver 2-pin		DA 2.2 inductive 32-line single-turn			
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 38: 8LSA46.R2060D200-3, 8LSA46.R2060D300-3, 8LSA46.DA030S000-3, 8LSA46.DA030S100-3, 8LSA46.DA030S200-3, 8LSA46.DA030S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA46. DA060S000-3	8LSA46. DA060S100-3	8LSA46. DA060S200-3	8LSA46. DA060S300-3	8LSA46. DB030S000-3	8LSA46. DB030S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000			3000		
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	5			7.7		
Nominal power $P_N$ [W]	3142			2419		
Nominal current $I_N$ [A]	6.1			4.7		
Stall torque $M_0$ [Nm]	10					
Stall current $I_0$ [A]	12.3			6.1		
Maximum torque $M_{max}$ [Nm]	38					
Maximum current $I_{max}$ [A]	72.9			36.5		
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	0.81			1.63		
Voltage constant $K_E$ [V/1000 rpm]	49.2			98.4		
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.48			1.92		
Stator inductance $L_{zph}$ [mH]	4.36			17.44		
Electrical time constant $t_{el}$ [ms]	9.1					
Thermal time constant $t_{therm}$ [min]	40					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	4.39					
Mass without brake $m$ [kg]	7.3					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180			1090		
ACOPOS multi inverter module 8BVxxxx...	0110			0055		
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5			0.75		
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn			DB 2.2 inductive 32-line multi-turn		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 39: 8LSA46.DA060S000-3, 8LSA46.DA060S100-3, 8LSA46.DA060S200-3, 8LSA46.DA060S300-3, 8LSA46.DB030S000-3, 8LSA46.DB030S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA46. DB030S200-3	8LSA46. DB030S300-3	8LSA46. DB060S000-3	8LSA46. DB060S100-3	8LSA46. DB060S200-3	8LSA46. DB060S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000		6000			
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	7.7		5			
Nominal power $P_N$ [W]	2419		3142			
Nominal current $I_N$ [A]	4.7		6.1			
Stall torque $M_0$ [Nm]			10			
Stall current $I_0$ [A]	6.1		12.3			
Maximum torque $M_{max}$ [Nm]			38			
Maximum current $I_{max}$ [A]	36.5		72.9			
Maximum speed $n_{max}$ [rpm]			12000			
Torque constant $K_T$ [Nm/A]	1.63		0.81			
Voltage constant $K_E$ [V/1000 rpm]	98.4		49.2			
Stator resistance $R_{zph}$ [ $\Omega$ ]	1.92		0.48			
Stator inductance $L_{zph}$ [mH]	17.44		4.36			
Electrical time constant $t_{el}$ [ms]			9.1			
Thermal time constant $t_{therm}$ [min]			40			
Moment of inertia $J$ [kgcm <sup>2</sup> ]			4.39			
Mass without brake $m$ [kg]			7.3			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			8			
Brake mass [kg]			1			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			0.54			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090		1180			
ACOPOS multi inverter module 8BVxxxx...	0055		0110			
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75		1.5			
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DB 2.2 inductive 32-line multi-turn					
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 40: 8LSA46.DB030S200-3, 8LSA46.DB030S300-3, 8LSA46.DB060S000-3, 8LSA46.DB060S100-3, 8LSA46.DB060S200-3, 8LSA46.DB060S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.



Model number	8LSA55. R2030D000-3	8LSA55. R2030D100-3	8LSA55. R2030D200-3	8LSA55. R2030D300-3	8LSA55. DA030S000-3	8LSA55. DA030S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]				3000		
Number of pole pairs				4		
Nominal torque $M_N$ [Nm]				11.6		
Nominal power $P_N$ [W]				3644		
Nominal current $I_N$ [A]				7.1		
Stall torque $M_0$ [Nm]				12.5		
Stall current $I_0$ [A]				7.7		
Maximum torque $M_{max}$ [Nm]				41.4		
Maximum current $I_{max}$ [A]				33		
Maximum speed $n_{max}$ [rpm]				9000		
Torque constant $K_T$ [Nm/A]				1.63		
Voltage constant $K_E$ [V/1000 rpm]				98.44		
Stator resistance $R_{zph}$ [ $\Omega$ ]				1.127		
Stator inductance $L_{zph}$ [mH]				12.5		
Electrical time constant $t_{el}$ [ms]				11.1		
Thermal time constant $t_{therm}$ [min]				40		
Moment of inertia $J$ [kgcm <sup>2</sup> ]				8.19		
Mass without brake $m$ [kg]				10.4		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]				15		
Brake mass [kg]				1.47		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]				1.66		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...				1090		
ACOPOS multi inverter module 8BVxxxx...				0110		
Cross section for B&R motor cables [mm <sup>2</sup> ]				0.75		
Connector type				speedtec		
Connector size				1.0		
<b>Options</b>						
Connection type	Male connector			Single-cable solution		
Connection direction	Angled (swivel connector)			Swivel, SCS		
Encoder	R2 resolver 2-pin			DA 2.2 inductive 32-line single-turn		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 41: 8LSA55.R2030D000-3, 8LSA55.R2030D100-3, 8LSA55.R2030D200-3, 8LSA55.R2030D300-3, 8LSA55.DA030S000-3, 8LSA55.DA030S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA55. DA030S200-3	8LSA55. DA030S300-3	8LSA55. DB030S000-3	8LSA55. DB030S100-3	8LSA55. DB030S200-3	8LSA55. DB030S300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]				3000		
Number of pole pairs				4		
Nominal torque $M_N$ [Nm]				11.6		
Nominal power $P_N$ [W]				3644		
Nominal current $I_N$ [A]				7.1		
Stall torque $M_0$ [Nm]				12.5		
Stall current $I_0$ [A]				7.7		
Maximum torque $M_{max}$ [Nm]				41.4		
Maximum current $I_{max}$ [A]				33		
Maximum speed $n_{max}$ [rpm]				9000		
Torque constant $K_T$ [Nm/A]				1.63		
Voltage constant $K_E$ [V/1000 rpm]				98.44		
Stator resistance $R_{zph}$ [ $\Omega$ ]				1.127		
Stator inductance $L_{zph}$ [mH]				12.5		
Electrical time constant $t_{el}$ [ms]				11.1		
Thermal time constant $t_{therm}$ [min]				40		
Moment of inertia $J$ [kgcm <sup>2</sup> ]				8.19		
Mass without brake $m$ [kg]				10.4		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]				15		
Brake mass [kg]				1.47		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]				1.66		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...				1090		
ACOPOS multi inverter module 8BVxxxx...				0110		
Cross section for B&R motor cables [mm <sup>2</sup> ]				0.75		
Connector type				speedtec		
Connector size				1.0		
<b>Options</b>						
Connection type				Single-cable solution		
Connection direction				Swivel, SCS		
Encoder	DA 2.2 inductive 32-line single-turn		DB 2.2 inductive 32-line multi-turn			
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 42: 8LSA55.DA030S200-3, 8LSA55.DA030S300-3, 8LSA55.DB030S000-3, 8LSA55.DB030S100-3, 8LSA55.DB030S200-3, 8LSA55.DB030S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA55. EA030D000-3	8LSA55. EA030D200-3	8LSA55. EB030D000-3	8LSA55. EB030D200-3	8LSA57. R2030D000-3	8LSA57. R2030D100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000					
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	11.6			17.5		
Nominal power $P_N$ [W]	3644			5498		
Nominal current $I_N$ [A]	7.1			10.7		
Stall torque $M_0$ [Nm]	12.5			20		
Stall current $I_0$ [A]	7.7			12.3		
Maximum torque $M_{max}$ [Nm]	41.4			69		
Maximum current $I_{max}$ [A]	33			52.6		
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	1.63					
Voltage constant $K_E$ [V/1000 rpm]	98.44					
Stator resistance $R_{zph}$ [ $\Omega$ ]	1.127			0.62		
Stator inductance $L_{zph}$ [mH]	12.5			7.21		
Electrical time constant $t_{el}$ [ms]	11.1			11.6		
Thermal time constant $t_{therm}$ [min]	40			46		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	8.19			13.13		
Mass without brake $m$ [kg]	10.4			14.5		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15					
Brake mass [kg]	1.47			1.3		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...	1090			1180		
ACOPOS multi inverter module 8BVlxxx...	0110					
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75			1.5		
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Male connector					
Connection direction	Angled (swivel connector)					
Encoder	EA inductive 32-line single-turn V2	EB inductive 32-line multi-turn V2		R2 resolver 2-pin		
Shaft end	Smooth shaft					Keyed shaft

Table 43: 8LSA55.EA030D000-3, 8LSA55.EA030D200-3, 8LSA55.EB030D000-3, 8LSA55.EB030D200-3, 8LSA57.R2030D000-3, 8LSA57.R2030D100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA57. DA030S000-3	8LSA57. DA030S100-3	8LSA57. DA030S200-3	8LSA57. DA030S300-3	8LSA57. DB030S000-3	8LSA57. DB030S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000					
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	17.5					
Nominal power $P_N$ [W]	5498					
Nominal current $I_N$ [A]	10.7					
Stall torque $M_0$ [Nm]	20					
Stall current $I_0$ [A]	12.3					
Maximum torque $M_{max}$ [Nm]	69					
Maximum current $I_{max}$ [A]	52.6					
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	1.63					
Voltage constant $K_E$ [V/1000 rpm]	98.44					
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.62					
Stator inductance $L_{zph}$ [mH]	7.21					
Electrical time constant $t_{el}$ [ms]	11.6					
Thermal time constant $t_{therm}$ [min]	46					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	13.13					
Mass without brake $m$ [kg]	14.5					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15					
Brake mass [kg]	1.3					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180					
ACOPOS multi inverter module 8BVxxxx...	0110					
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn				DB 2.2 inductive 32-line multi-turn	
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 44: 8LSA57.DA030S000-3, 8LSA57.DA030S100-3, 8LSA57.DA030S200-3, 8LSA57.DA030S300-3, 8LSA57.DB030S000-3, 8LSA57.DB030S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA57. DB030S200-3	8LSA57. DB030S300-3	8LSA73. R2030D000-3	8LSA73. R2030D100-3	8LSA73. R2030D200-3	8LSA73. R2030D300-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000					
Number of pole pairs	4		5			
Nominal torque $M_N$ [Nm]	17.5		20.5			
Nominal power $P_N$ [W]	5498		6440			
Nominal current $I_N$ [A]	10.7		12.58			
Stall torque $M_0$ [Nm]	20		26			
Stall current $I_0$ [A]	12.3		15.95			
Maximum torque $M_{max}$ [Nm]	69		107			
Maximum current $I_{max}$ [A]	52.6		96.54			
Maximum speed $n_{max}$ [rpm]	9000		6000			
Torque constant $K_T$ [Nm/A]			1.63			
Voltage constant $K_E$ [V/1000 rpm]			98.44			
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.62		0.42			
Stator inductance $L_{zph}$ [mH]	7.21		6.5			
Electrical time constant $t_{el}$ [ms]	11.6		15.48			
Thermal time constant $t_{therm}$ [min]	46		37			
Moment of inertia $J$ [kgcm <sup>2</sup> ]	13.13		46			
Mass without brake $m$ [kg]	14.5		20			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15		47			
Brake mass [kg]	1.3		3.8			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66		32			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...			1180			
ACOPOS multi inverter module 8BVxxxx...	0110		0220			
Cross section for B&R motor cables [mm <sup>2</sup> ]			1.5			
Connector type			speedtec			
Connector size			1.0			
<b>Options</b>						
Connection type	Single-cable solution			Male connector		
Connection direction	Swivel, SCS			Angled (swivel connector)		
Encoder	DB 2.2 inductive 32-line multi-turn			R2 resolver 2-pin		
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 45: 8LSA57.DB030S200-3, 8LSA57.DB030S300-3, 8LSA73.R2030D000-3, 8LSA73.R2030D100-3, 8LSA73.R2030D200-3, 8LSA73.R2030D300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA73. DA030S000-3	8LSA73. DA030S100-3	8LSA73. DA030S200-3	8LSA73. DA030S300-3	8LSA73. DB030S000-3	8LSA73. DB030S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000					
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	20.5					
Nominal power $P_N$ [W]	6440					
Nominal current $I_N$ [A]	12.58					
Stall torque $M_0$ [Nm]	26					
Stall current $I_0$ [A]	15.95					
Maximum torque $M_{max}$ [Nm]	107					
Maximum current $I_{max}$ [A]	96.54					
Maximum speed $n_{max}$ [rpm]	6000					
Torque constant $K_T$ [Nm/A]	1.63					
Voltage constant $K_E$ [V/1000 rpm]	98.44					
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.42					
Stator inductance $L_{zph}$ [mH]	6.5					
Electrical time constant $t_{el}$ [ms]	15.48					
Thermal time constant $t_{therm}$ [min]	37					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	46					
Mass without brake $m$ [kg]	20					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	47					
Brake mass [kg]	3.8					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	32					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180					
ACOPOS multi inverter module 8BVxxxx...	0220					
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5					
Connector type	speedtec					
Connector size	1.0					
<b>Options</b>						
Connection type	Single-cable solution					
Connection direction	Swivel, SCS					
Encoder	DA 2.2 inductive 32-line single-turn				DB 2.2 inductive 32-line multi-turn	
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 46: 8LSA73.DA030S000-3, 8LSA73.DA030S100-3, 8LSA73.DA030S200-3, 8LSA73.DA030S300-3, 8LSA73.DB030S000-3, 8LSA73.DB030S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA73. DB030S200-3	8LSA73. DB030S300-3	8LSA75. R2030D000-3	8LSA75. R2030D100-3	8LSA75. R2030D200-3	8LSA75. R2030D300-3	
<b>Motor</b>							
Nominal speed $n_N$ [rpm]	3000						
Number of pole pairs	5						
Nominal torque $M_N$ [Nm]	20.5		30				
Nominal power $P_N$ [W]	6440		9425				
Nominal current $I_N$ [A]	12.58		18.41				
Stall torque $M_0$ [Nm]	26		43				
Stall current $I_0$ [A]	15.95		26.38				
Maximum torque $M_{max}$ [Nm]	107		187				
Maximum current $I_{max}$ [A]	96.54		168.71				
Maximum speed $n_{max}$ [rpm]	6000		4500				
Torque constant $K_T$ [Nm/A]	1.63						
Voltage constant $K_E$ [V/1000 rpm]	98.44						
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.42		0.21				
Stator inductance $L_{zph}$ [mH]	6.5		3.9				
Electrical time constant $t_{el}$ [ms]	15.48		18.57				
Thermal time constant $t_{therm}$ [min]	37		46				
Moment of inertia $J$ [kgcm <sup>2</sup> ]	46		74				
Mass without brake $m$ [kg]	20		28				
<b>Holding brake</b>							
Holding torque of the brake $M_{Br}$ [Nm]	47						
Brake mass [kg]	3.8						
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	32						
<b>Recommendations</b>							
ACOPOS servo drive 8Vxxxx.xx...	1180		1320				
ACOPOS multi inverter module 8BVxxxx...	0220		0330				
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5		4				
Connector type	speedtec						
Connector size	1.0						
<b>Options</b>							
Connection type	Single-cable solution			Male connector			
Connection direction	Swivel, SCS			Angled (swivel connector)			
Encoder	DB 2.2 inductive 32-line multi-turn			R2 resolver 2-pin			
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	

Table 47: 8LSA73.DB030S200-3, 8LSA73.DB030S300-3, 8LSA75.R2030D000-3, 8LSA75.R2030D100-3, 8LSA75.R2030D200-3, 8LSA75.R2030D300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA75. DA030S000-3	8LSA75. DA030S100-3	8LSA75. DA030S200-3	8LSA75. DA030S300-3	8LSA75. DB030S000-3	8LSA75. DB030S100-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]				3000		
Number of pole pairs				5		
Nominal torque $M_N$ [Nm]				30		
Nominal power $P_N$ [W]				9425		
Nominal current $I_N$ [A]				18.41		
Stall torque $M_0$ [Nm]				43		
Stall current $I_0$ [A]				26.38		
Maximum torque $M_{max}$ [Nm]				187		
Maximum current $I_{max}$ [A]				168.71		
Maximum speed $n_{max}$ [rpm]				4500		
Torque constant $K_T$ [Nm/A]				1.63		
Voltage constant $K_E$ [V/1000 rpm]				98.44		
Stator resistance $R_{zph}$ [ $\Omega$ ]				0.21		
Stator inductance $L_{zph}$ [mH]				3.9		
Electrical time constant $t_{el}$ [ms]				18.57		
Thermal time constant $t_{therm}$ [min]				46		
Moment of inertia $J$ [kgcm <sup>2</sup> ]				74		
Mass without brake $m$ [kg]				28		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]				47		
Brake mass [kg]				3.8		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]				32		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...				1320		
ACOPOS multi inverter module 8BVxxxx...				0330		
Cross section for B&R motor cables [mm <sup>2</sup> ]				4		
Connector type				speedtec		
Connector size				1.0		
<b>Options</b>						
Connection type				Single-cable solution		
Connection direction				Swivel, SCS		
Encoder				DA 2.2 inductive 32-line single-turn		DB 2.2 inductive 32-line multi-turn
Shaft end	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft	Smooth shaft	Keyed shaft

Table 48: 8LSA75.DA030S000-3, 8LSA75.DA030S100-3, 8LSA75.DA030S200-3, 8LSA75.DA030S300-3, 8LSA75.DB030S000-3, 8LSA75.DB030S100-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.



Model number	8LSA75.DB030S200-3	8LSA75.DB030S300-3
<b>Motor</b>		
Nominal speed $n_N$ [rpm]		3000
Number of pole pairs		5
Nominal torque $M_N$ [Nm]		30
Nominal power $P_N$ [W]		9425
Nominal current $I_N$ [A]		18.41
Stall torque $M_0$ [Nm]		43
Stall current $I_0$ [A]		26.38
Maximum torque $M_{max}$ [Nm]		187
Maximum current $I_{max}$ [A]		168.71
Maximum speed $n_{max}$ [rpm]		4500
Torque constant $K_T$ [Nm/A]		1.63
Voltage constant $K_E$ [V/1000 rpm]		98.44
Stator resistance $R_{zph}$ [ $\Omega$ ]		0.21
Stator inductance $L_{zph}$ [mH]		3.9
Electrical time constant $t_{el}$ [ms]		18.57
Thermal time constant $t_{therm}$ [min]		46
Moment of inertia $J$ [kgcm <sup>2</sup> ]		74
Mass without brake $m$ [kg]		28
<b>Holding brake</b>		
Holding torque of the brake $M_{Br}$ [Nm]		47
Brake mass [kg]		3.8
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]		32
<b>Recommendations</b>		
ACOPOS servo drive 8Vxxx.xx...		1320
ACOPOS multi inverter module 8BVIxxx...		0330
Cross section for B&R motor cables [mm <sup>2</sup> ]		4
Connector type		speedtec
Connector size		1.0
<b>Options</b>		
Connection type		Single-cable solution
Connection direction		Swivel, SCS
Encoder		DB 2.2 inductive 32-line multi-turn
Shaft end	Smooth shaft	Keyed shaft

Table 49: 8LSA75.DB030S200-3, 8LSA75.DB030S300-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## 2.7 Technical data - Cooling type A

### 2.7.1 Technical data - 8LSA2 V3

Model number	8LSA23. ee060ffgg-3	8LSA24. ee060ffgg-3	8LSA25. ee045ffgg-3	8LSA25. ee060ffgg-3	8LSA26. ee045ffgg-3	8LSA26. ee060ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000		4500	6000	4500	6000
Number of pole pairs	4					
Nominal torque $M_n$ [Nm]	0.17	0.35	0.54	0.52	0.72	0.69
Nominal power $P_N$ [W]	107	220	254	327	339	434
Nominal current $I_N$ [A]	0.23	0.48	0.56	0.71	0.8	0.95
Stall torque $M_0$ [Nm]	0.2	0.4	0.6		0.8	
Stall current $I_0$ [A]	0.27	0.55	0.62	0.82	0.89	1.1
Maximum torque $M_{max}$ [Nm]	0.8	1.6	2.4		3.2	
Maximum current $I_{max}$ [A]	1.25	2.5	2.77	3.7	4.05	5
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	0.73		0.97	0.73	0.9	0.73
Voltage constant $K_E$ [V/1000 rpm]	43.98		58.64	43.98	54.45	43.98
Stator resistance $R_{2ph}$ [ $\Omega$ ]	178.6	52.3	63.4	34.63	33.75	24.7
Stator inductance $L_{2ph}$ [mH]	165	67.5	87.8	49.6	52.9	36.6
Electrical time constant $t_{el}$ [ms]	0.9	1.3	1.4		1.6	1.5
Thermal time constant $t_{therm}$ [min]	13	16	20		23	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	0.07	0.12	0.16		0.2	
Mass without brake $m$ [kg]	0.9	1.1	1.3		1.5	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]				2.2		
Brake mass [kg]				0.45		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]				0.12		
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...					1010	1016
ACOPOS multi inverter module 8BVlxxx...					0014	
Cross section for B&R motor cables [mm <sup>2</sup> ]					0.75	
Connector type					speedtec	
Connector size					1.0	

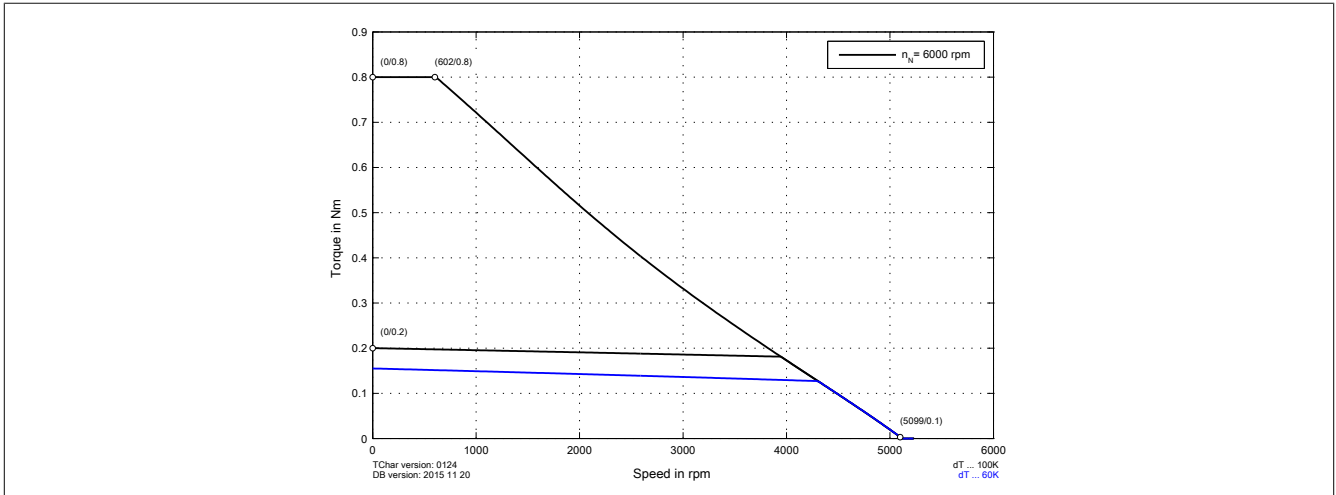
Table 50: 8LSA23.ee060ffgg-3, 8LSA24.ee060ffgg-3, 8LSA25.ee045ffgg-3, 8LSA25.ee060ffgg-3, 8LSA26.ee045ffgg-3, 8LSA26.ee060ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

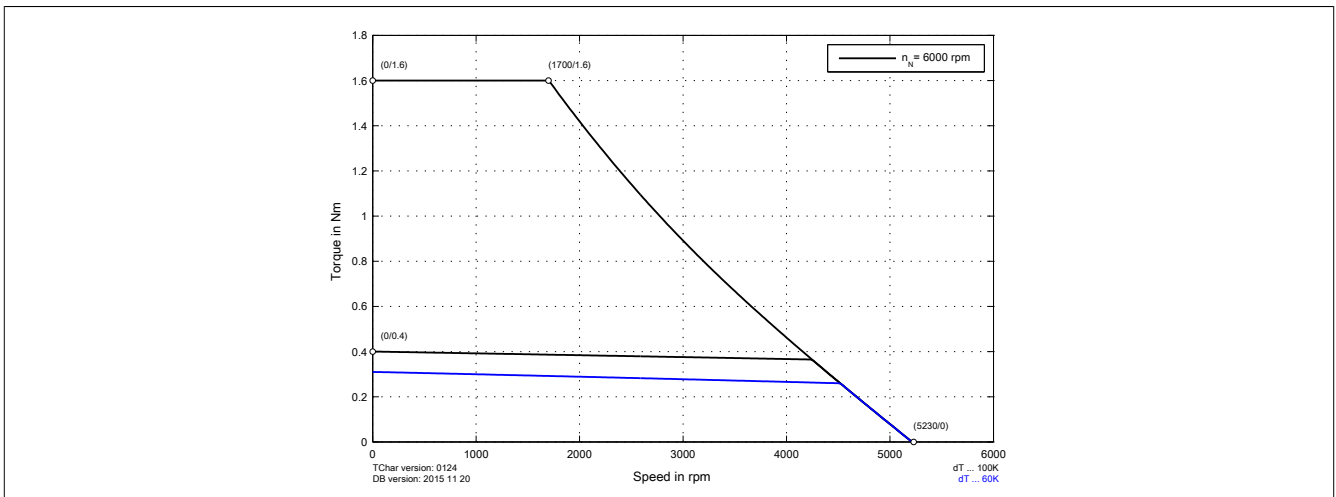
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

2.7.1.1 Speed-torque characteristics at DC bus voltage of 325 VDC

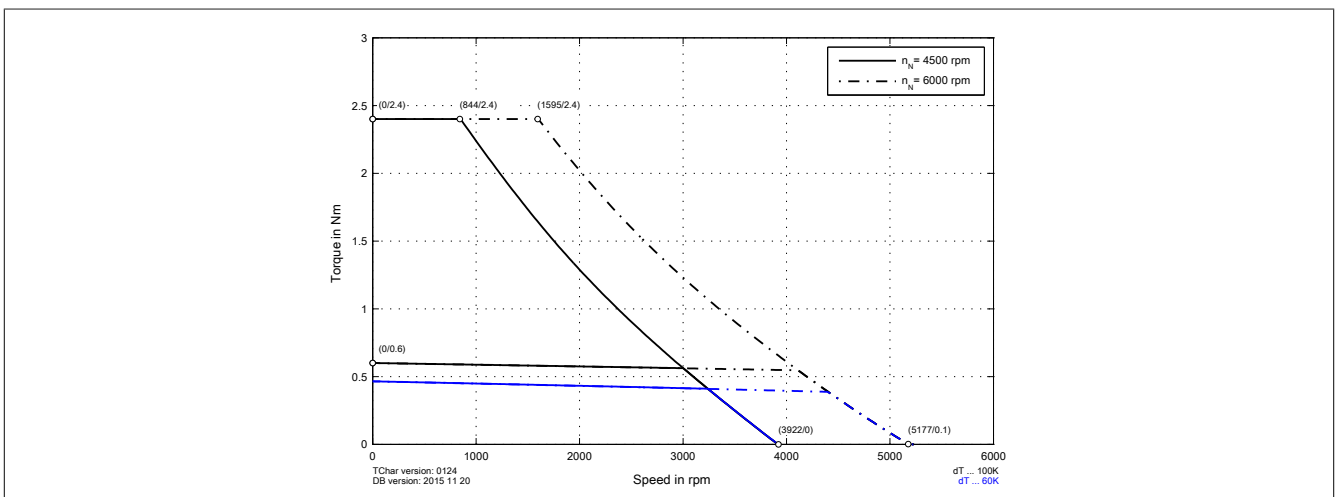
8LSA23.eennffgg-3



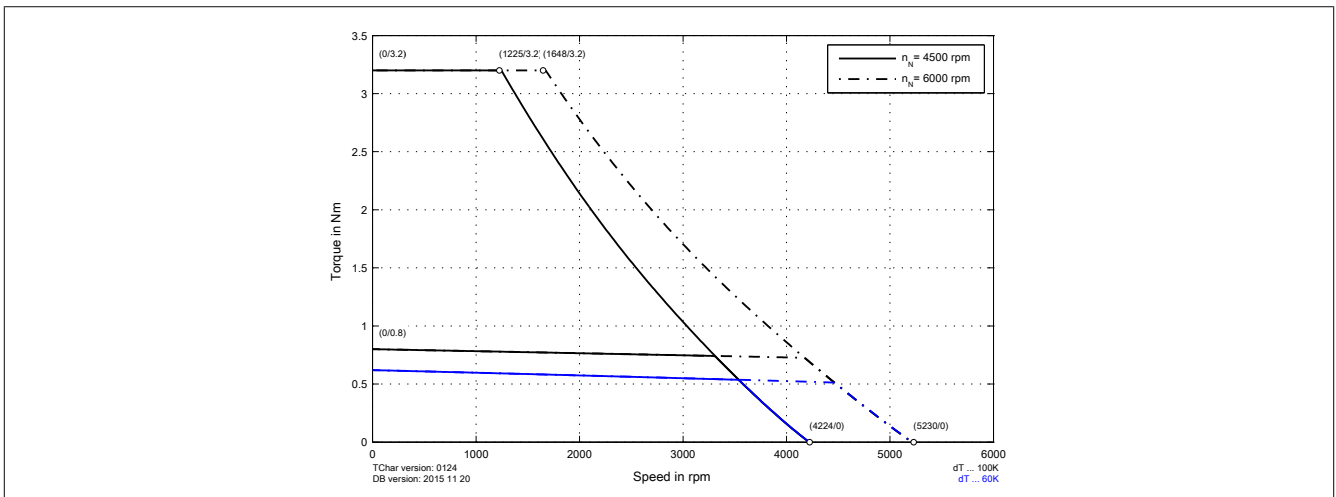
8LSA24.eennffgg-3



8LSA25.eennffgg-3

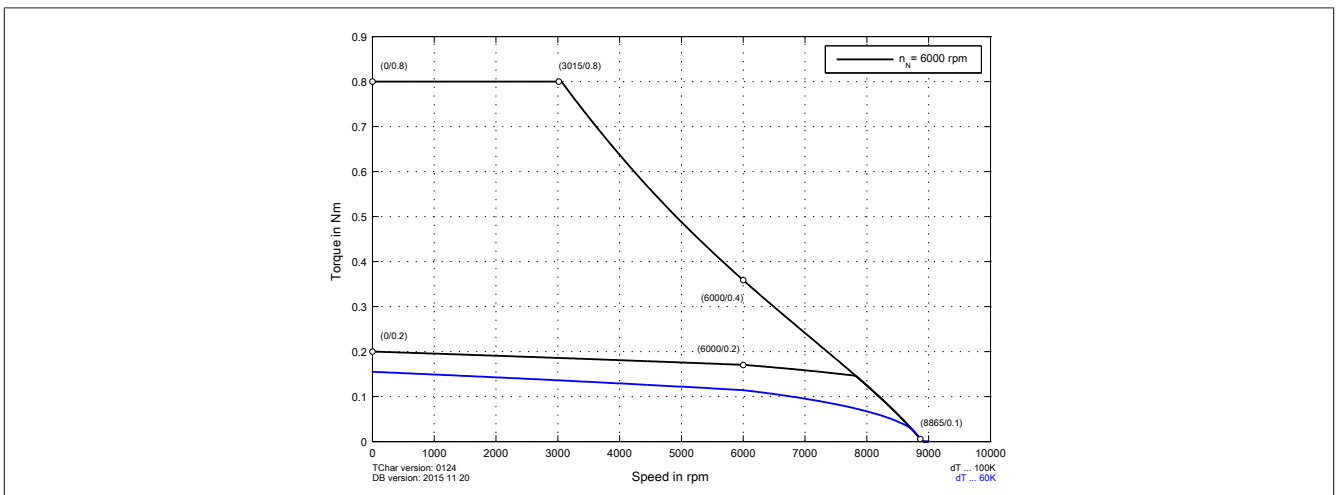


8LSA26.eennffgg-3

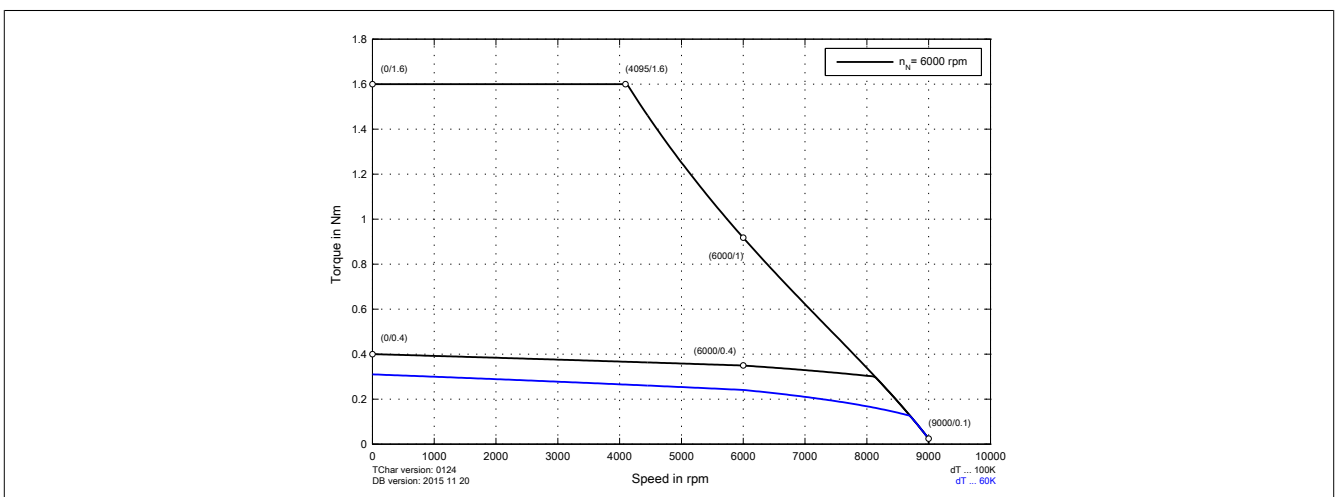


2.7.1.2 Speed-torque characteristics at DC bus voltage of 560 VDC

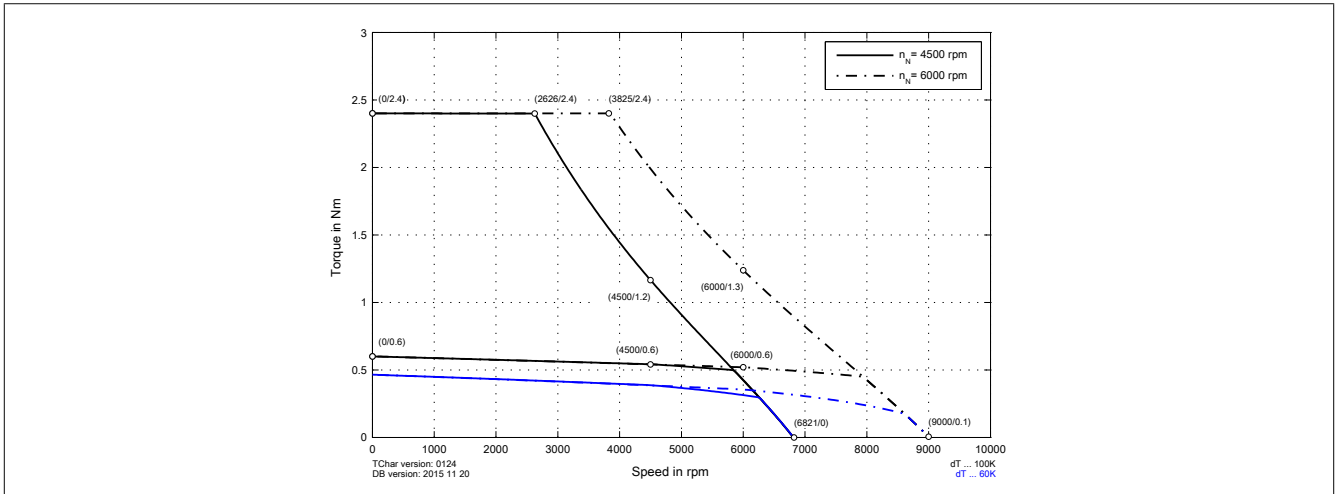
8LSA23.eennffgg-3



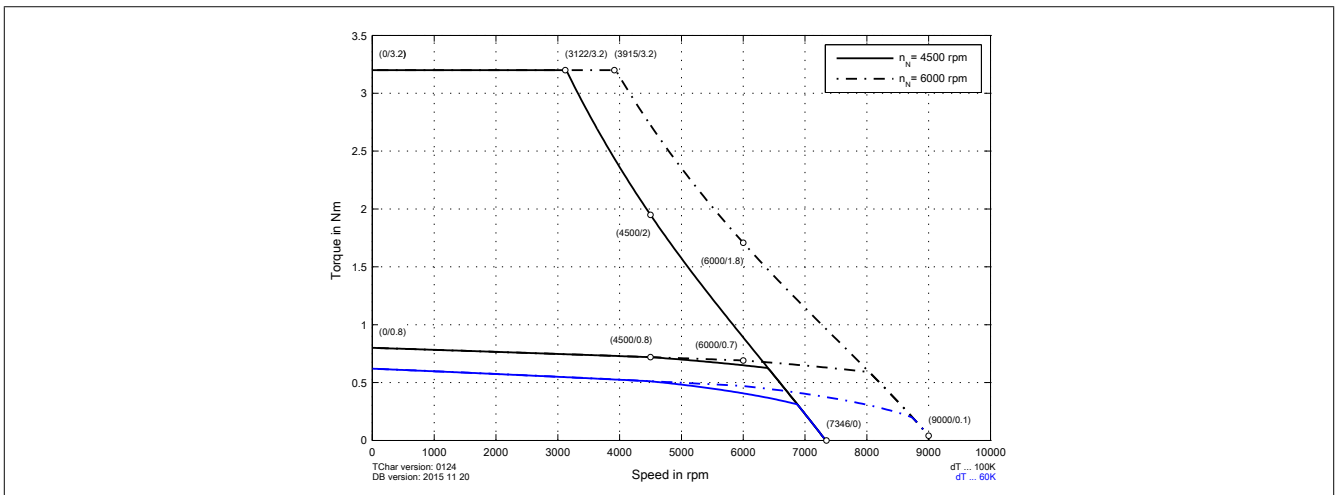
8LSA24.eennffgg-3



8LSA25.eennffgg-3

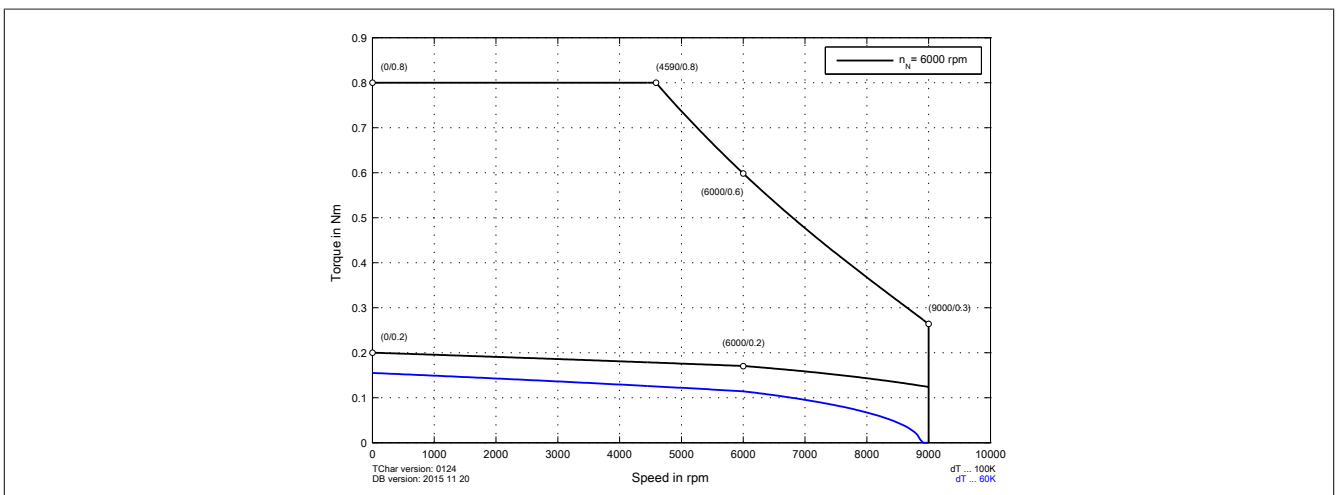


8LSA26.eennffgg-3

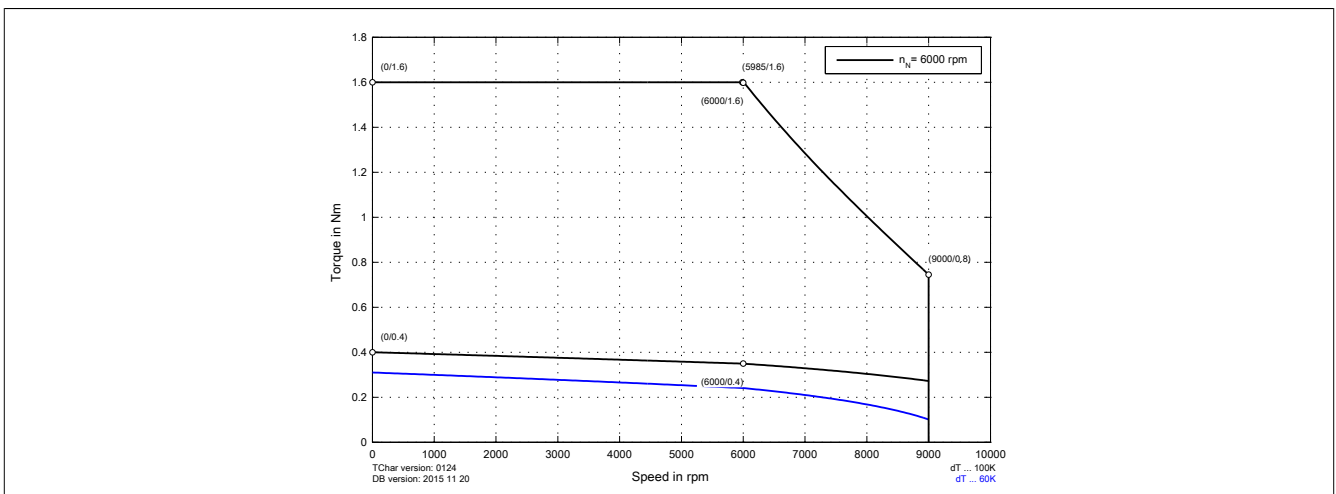


2.7.1.3 Speed-torque characteristics at DC bus voltage of 750 VDC

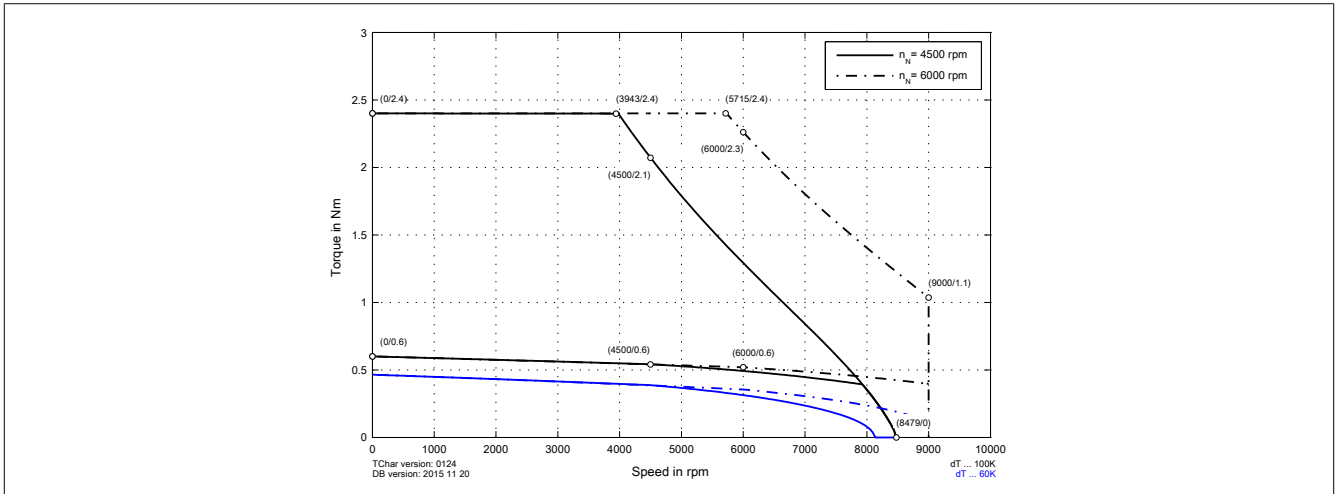
8LSA23.eennffgg-3



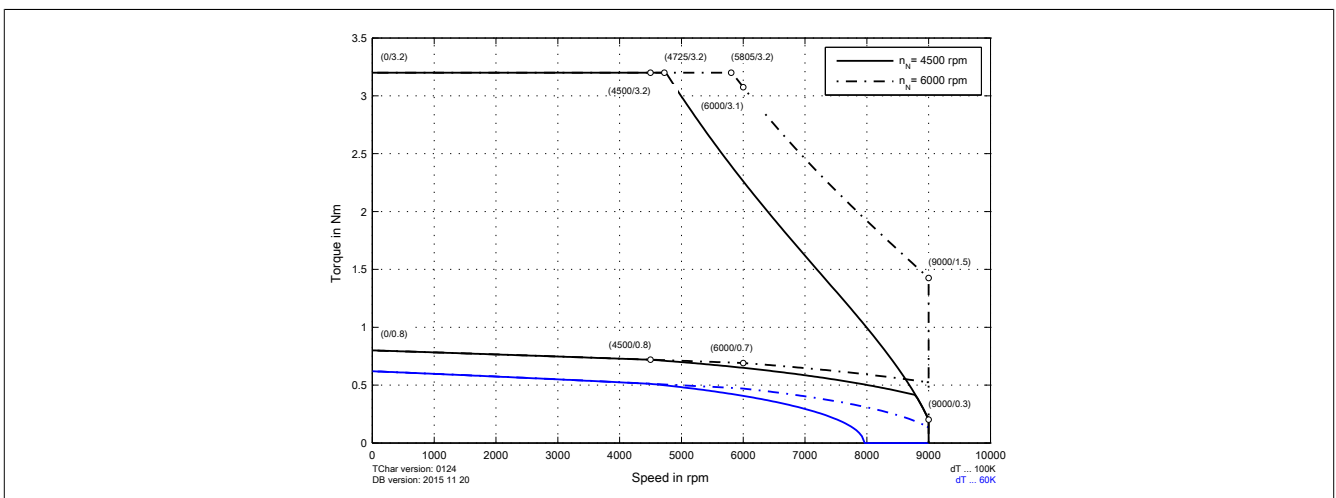
8LSA24.eennffgg-3



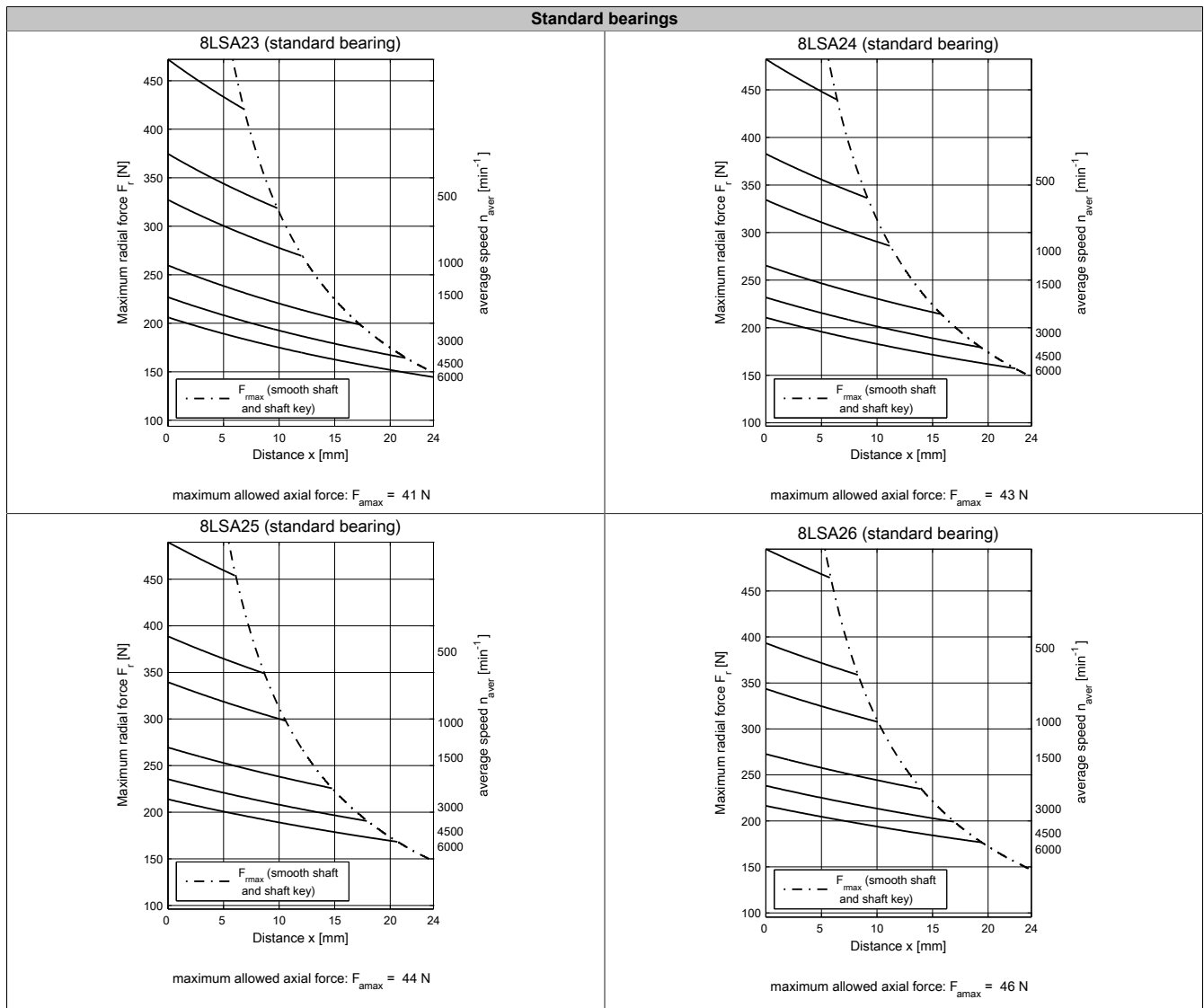
8LSA25.eennffgg-3



8LSA26.eennffgg-3

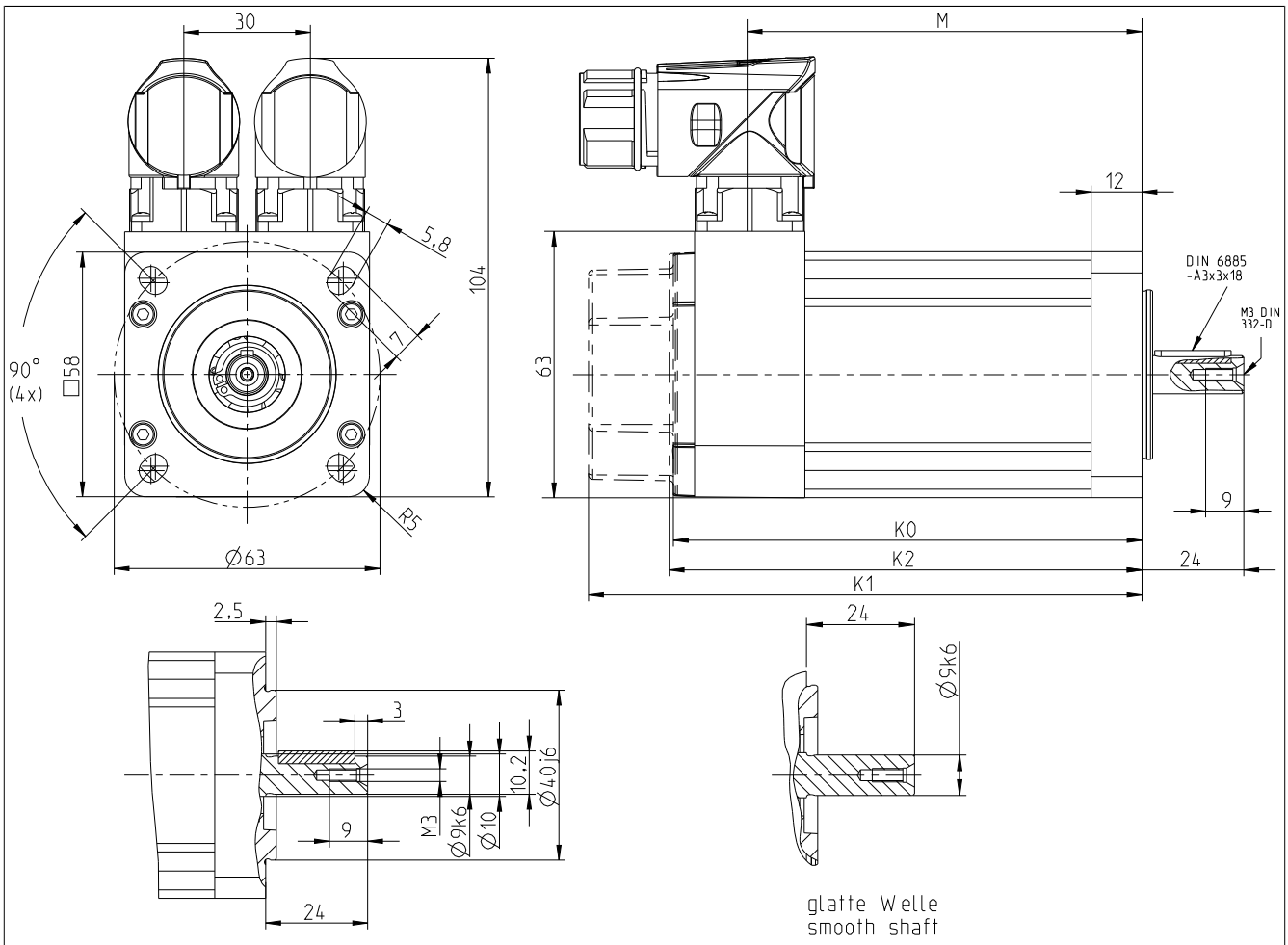


2.7.1.4 8LSA2 V3 - Permissible shaft load





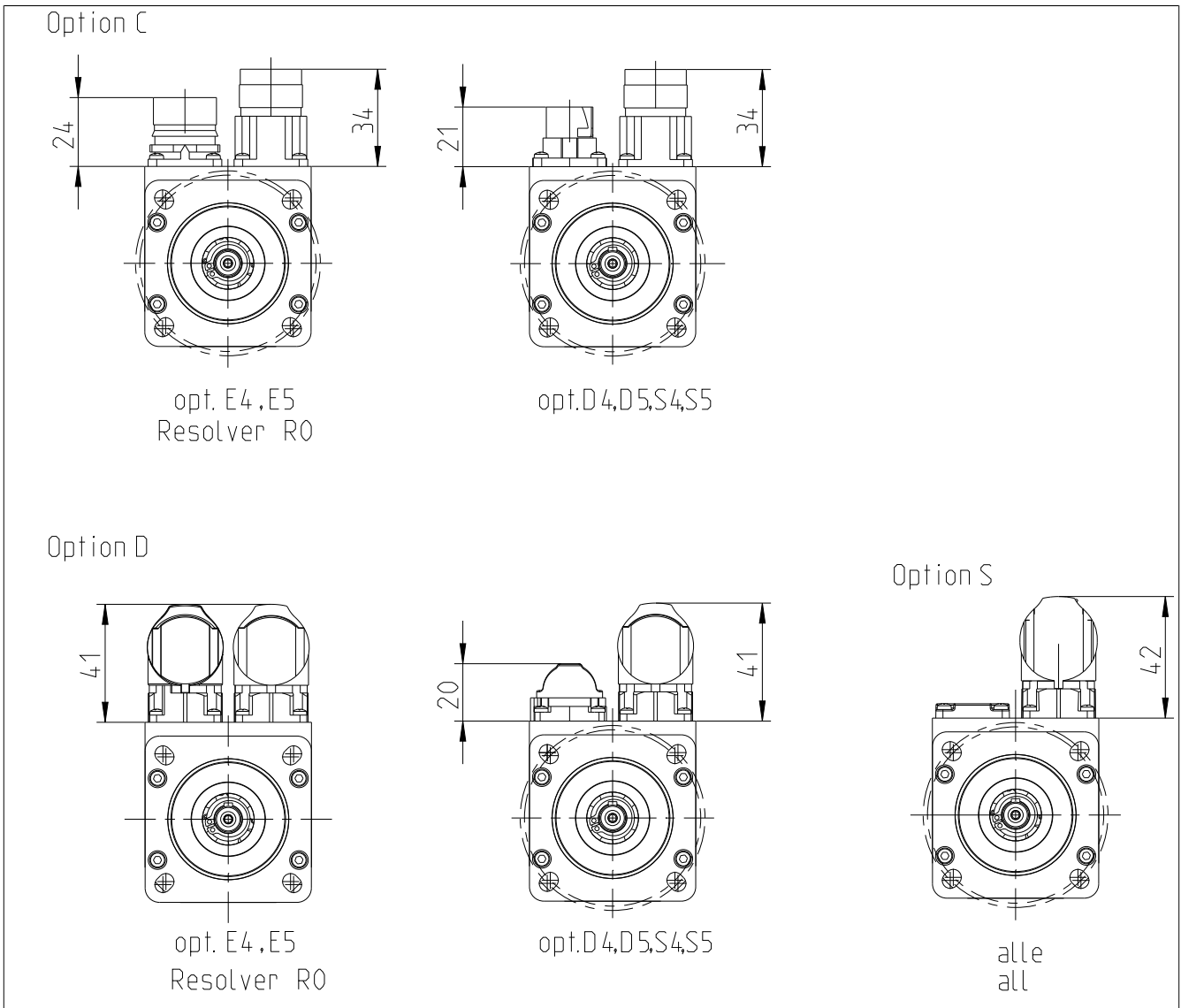
2.7.1.5 8LSA2 Version 3 - Dimensions



EnDat / resolver feedback					Extension of $K_0$ , $K_1$ , $K_2$ and M depending on the motor option [mm]	
Model number	$K_0$	$K_1$	$K_2$	M	Holding brake	Oil seal
<b>Encoder assignments</b>	<b>R0</b>	<b>E4,E5,D4,D5,S4,S5,S8,S9</b>	<b>E8,E9</b>			
8LSA23.eennffgg-3	91	111	92	73	24	7
8LSA24.eennffgg-3	101	121	102	83	24	7
8LSA25.eennffgg-3	111	131	112	93	24	7
8LSA26.eennffgg-3	121	141	122	103	24	7

Important: Extension of encoder cover for certain encoders, see dimension " $K_2$ "

2.7.1.6 8LSA2 V3 - Connector options - Dimensions



## 2.7.2 Technical data - 8LSA3 V3

Model number	8LSA33. ee030ffgg-3	8LSA33. ee045ffgg-3	8LSA33. ee060ffgg-3	8LSA34. ee022ffgg-3	8LSA34. ee030ffgg-3	8LSA34. ee045ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000	4500	6000	2200	3000	4500
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	0.7	0.67	0.6	1.44	1.4	1.3
Nominal power $P_N$ [W]	220	316	377	332	440	613
Nominal current $I_N$ [A]	0.48	0.69	0.82	0.72	0.96	1.34
Stall torque $M_0$ [Nm]	0.75			1.5		
Stall current $I_0$ [A]	0.52	0.77	1.03	0.75	1.03	1.55
Maximum torque $M_{max}$ [Nm]	3			6		
Maximum current $I_{max}$ [A]	2.2	3.3	4.4	3.2	4.4	6.6
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	1.45	0.97	0.73	1.99	1.45	0.97
Voltage constant $K_E$ [V/1000 rpm]	87.96	58.64	43.98	120.43	87.96	58.64
Stator resistance $R_{2ph}$ [ $\Omega$ ]	56.5	27.56	15.98	40.62	22.83	9.35
Stator inductance $L_{2ph}$ [mH]	214	98.4	58.2	184.2	102.3	43.7
Electrical time constant $t_{el}$ [ms]	3.8	3.6		4.5		4.7
Thermal time constant $t_{therm}$ [min]	30			32		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	0.4			0.65		
Mass without brake $m$ [kg]	3.2			3.8		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	4					
Brake mass [kg]	1.07					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1010		1016	1010	1016	1022
ACOPOS multi inverter module 8BVxxxx...	0014					
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 51: 8LSA33.ee030ffgg-3, 8LSA33.ee045ffgg-3, 8LSA33.ee060ffgg-3, 8LSA34.ee022ffgg-3, 8LSA34.ee030ffgg-3, 8LSA34.ee045ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA34. ee060ffgg-3	8LSA35. ee022ffgg-3	8LSA35. ee030ffgg-3	8LSA35. ee045ffgg-3	8LSA35. ee060ffgg-3	8LSA36. ee022ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	6000	2200	3000	4500	6000	2200
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	1	2.1		1.8	1.6	2.7
Nominal power $P_N$ [W]	628	484	660	848	1005	622
Nominal current $I_N$ [A]	1.37	1.1	1.4	1.9	2.2	1.4
Stall torque $M_0$ [Nm]	1.5	2.3				3
Stall current $I_0$ [A]	2.06	1.2	1.6	2.4	3.2	1.5
Maximum torque $M_{max}$ [Nm]	6	9.2				12
Maximum current $I_{max}$ [A]	8.9	5	6.8	10.2	13.6	6.5
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	0.73	1.99	1.45	0.97	0.73	1.99
Voltage constant $K_E$ [V/1000 rpm]	43.98	120.43	87.96	58.64	43.98	120.43
Stator resistance $R_{zph}$ [ $\Omega$ ]	5.08	24.26	12.22	6.16	3.02	15.18
Stator inductance $L_{zph}$ [mH]	23.86	119.9	63	29.7	15.6	83.4
Electrical time constant $t_{el}$ [ms]	4.7	4.9	5.2	4.8	5.1	5.5
Thermal time constant $t_{therm}$ [min]	32	34				36
Moment of inertia $J$ [kgcm <sup>2</sup> ]	0.65	0.9				1.15
Mass without brake $m$ [kg]	3.8	4.4				5
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	4					
Brake mass [kg]	1.07	1.09				1.07
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.38					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045	1016	1022	1045		1022
ACOPOS multi inverter module 8BVxxxx...	0028	0014		0028		0014
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 52: 8LSA34.ee060ffgg-3, 8LSA35.ee022ffgg-3, 8LSA35.ee030ffgg-3, 8LSA35.ee045ffgg-3, 8LSA35.ee060ffgg-3, 8LSA36.ee022ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA36. ee030ffgg-3	8LSA36. ee045ffgg-3	8LSA36. ee060ffgg-3	8LSA37. ee022ffgg-3	8LSA37. ee030ffgg-3	8LSA37. ee045ffgg-3	8LSA37. ee060ffgg-3
<b>Motor</b>							
Nominal speed $n_N$ [rpm]	3000	4500	6000	2200	3000	4500	6000
Number of pole pairs	4						
Nominal torque $M_N$ [Nm]	2.7	2.2	1.8	3.4		2.7	2
Nominal power $P_N$ [W]	848	1037	1131	783	1068	1272	1257
Nominal current $I_N$ [A]	1.9	2.3	2.5	1.7	2.3	2.8	2.7
Stall torque $M_0$ [Nm]	3			3.6			
Stall current $I_0$ [A]	2.1	3.1	4.1	1.8	2.5	3.7	4.9
Maximum torque $M_{max}$ [Nm]	12			14.4			
Maximum current $I_{max}$ [A]	8.9	13.3	17.7	7.8	10.6	16	21.2
Maximum speed $n_{max}$ [rpm]	9000						
Torque constant $K_T$ [Nm/A]	1.45	0.97	0.73	1.99	1.45	0.97	0.73
Voltage constant $K_E$ [V/1000 rpm]	87.96	58.64	43.98	120.43	87.96	58.64	43.98
Stator resistance $R_{zph}$ [ $\Omega$ ]	8.18	3.73	1.95	12.59	6.98	2.93	1.76
Stator inductance $L_{zph}$ [mH]	44.91	20.3	10.6	68.9	37.5	16.2	9.6
Electrical time constant $t_{el}$ [ms]	5.5	5.4	5.5		5.4	5.5	
Thermal time constant $t_{therm}$ [min]	36			38			
Moment of inertia $J$ [kgcm <sup>2</sup> ]	1.15			1.38			
Mass without brake $m$ [kg]	5			5.6			
<b>Holding brake</b>							
Holding torque of the brake $M_{Br}$ [Nm]				4			
Brake mass [kg]	1.07			0.59			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]				0.38			
<b>Recommendations</b>							
ACOPOS servo drive 8Vxxxx.xx...	1045		1090	1022	1045		1090
ACOPOS multi inverter module 8BVxxxx...	0028		0055	0028		0055	
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75						
Connector type	speedtec						
Connector size	1.0						

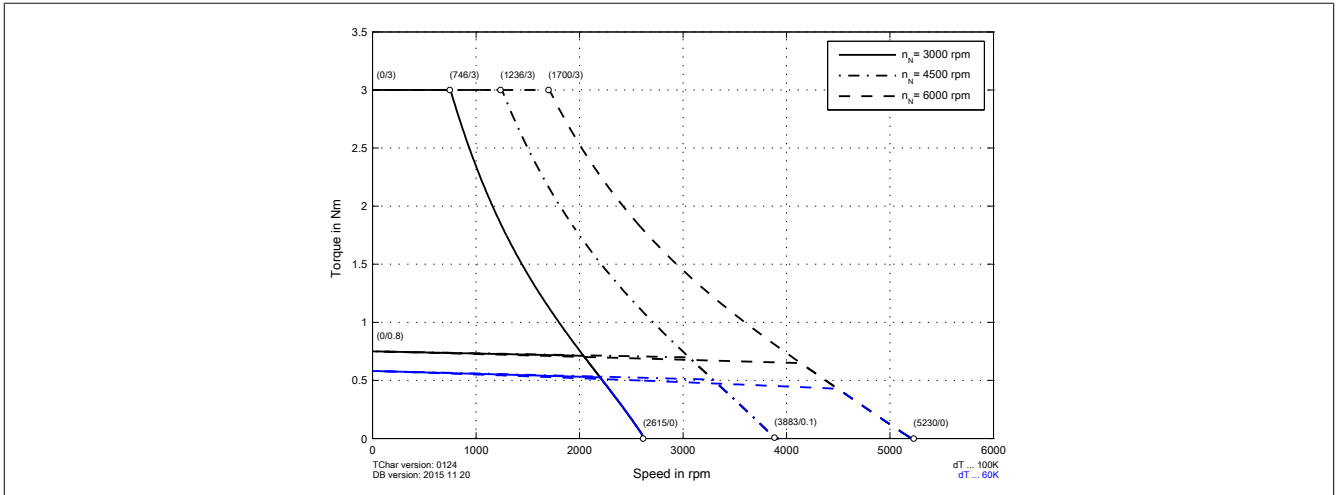
Table 53: 8LSA36.ee030ffgg-3, 8LSA36.ee045ffgg-3, 8LSA36.ee060ffgg-3, 8LSA37.ee022ffgg-3, 8LSA37.ee030ffgg-3, 8LSA37.ee045ffgg-3, 8LSA37.ee060ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

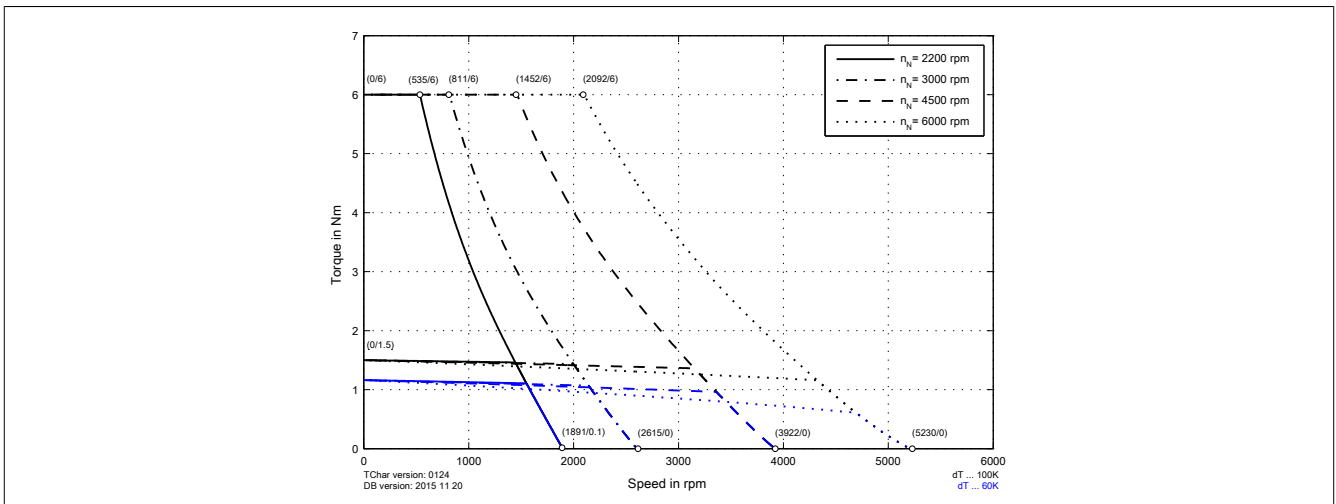
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

2.7.2.1 Speed-torque characteristics at DC bus voltage of 325 VDC

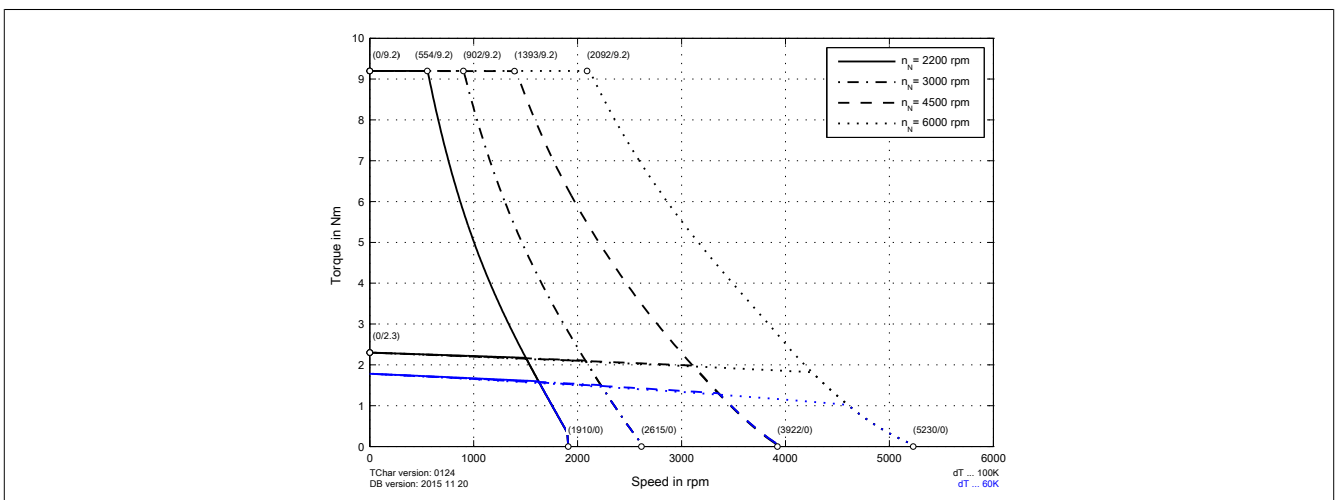
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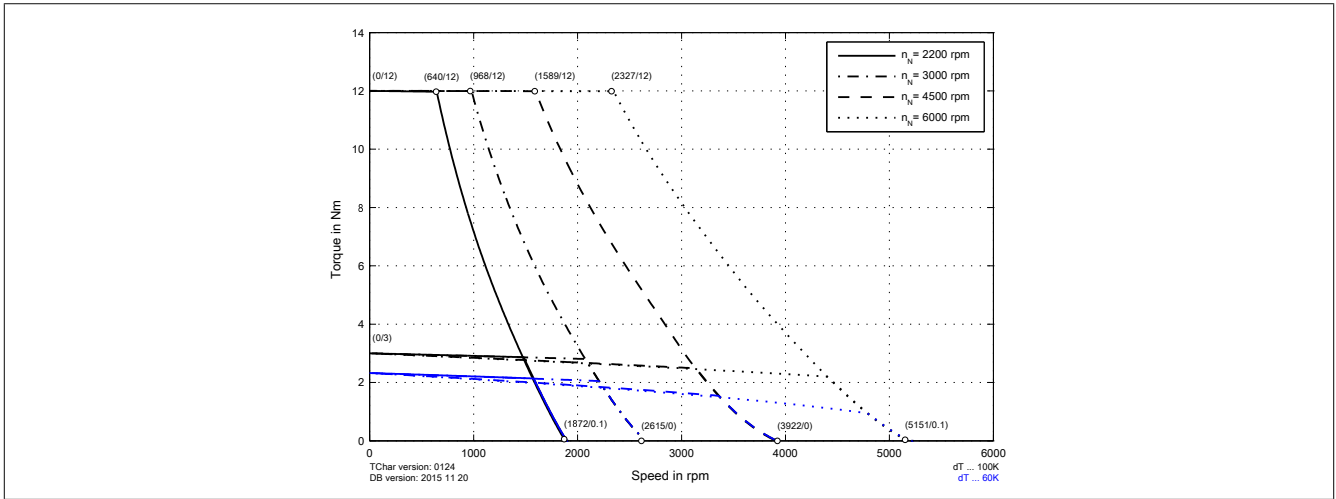
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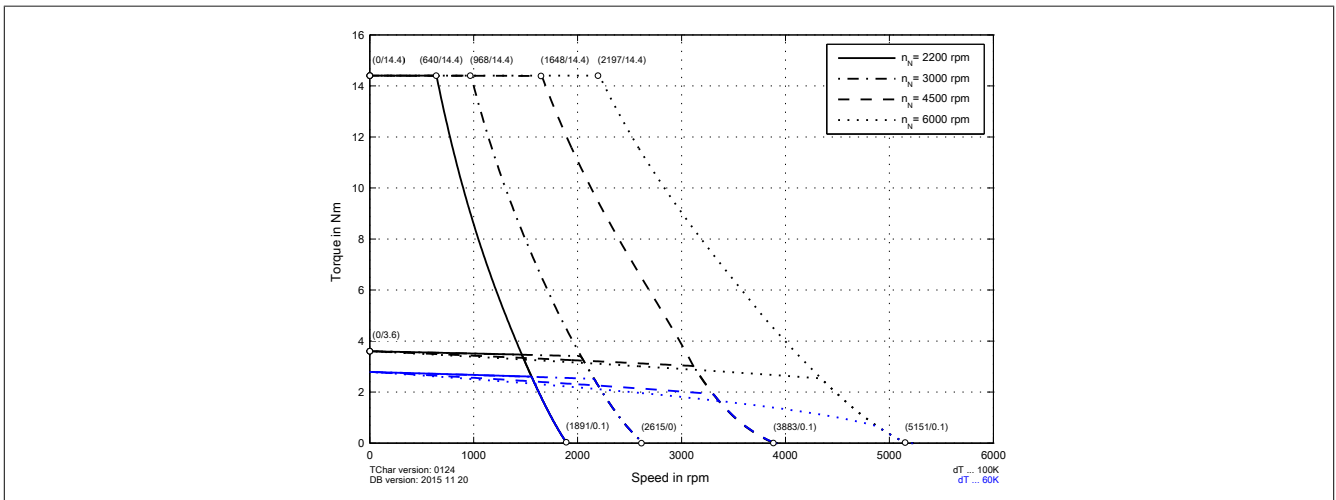
8LSA35.eennffgg-3



8LSA36.eennffgg-3

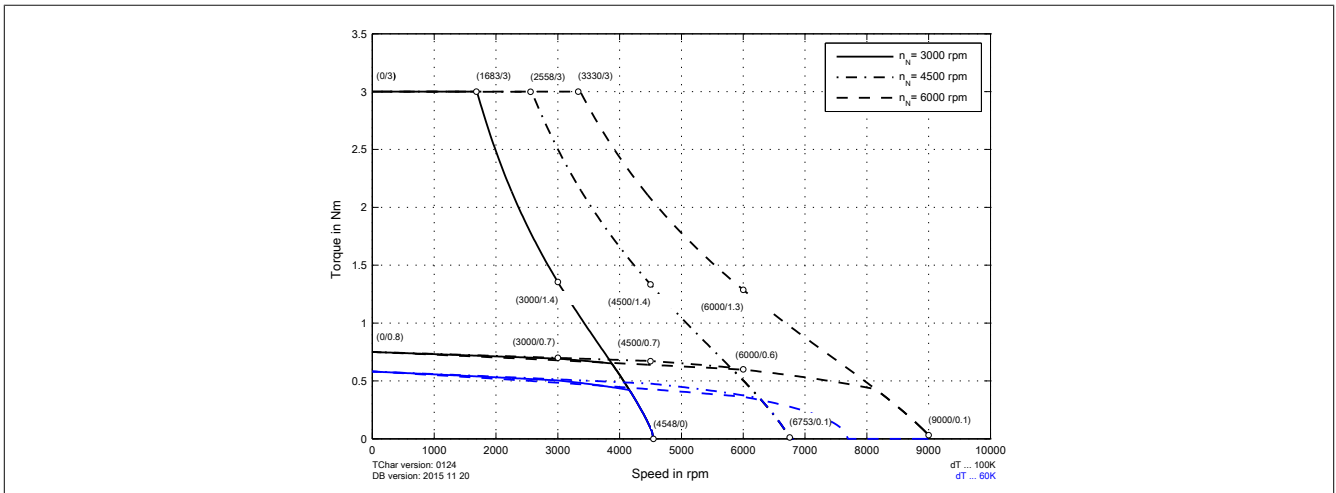


8LSA37.eennffgg-3

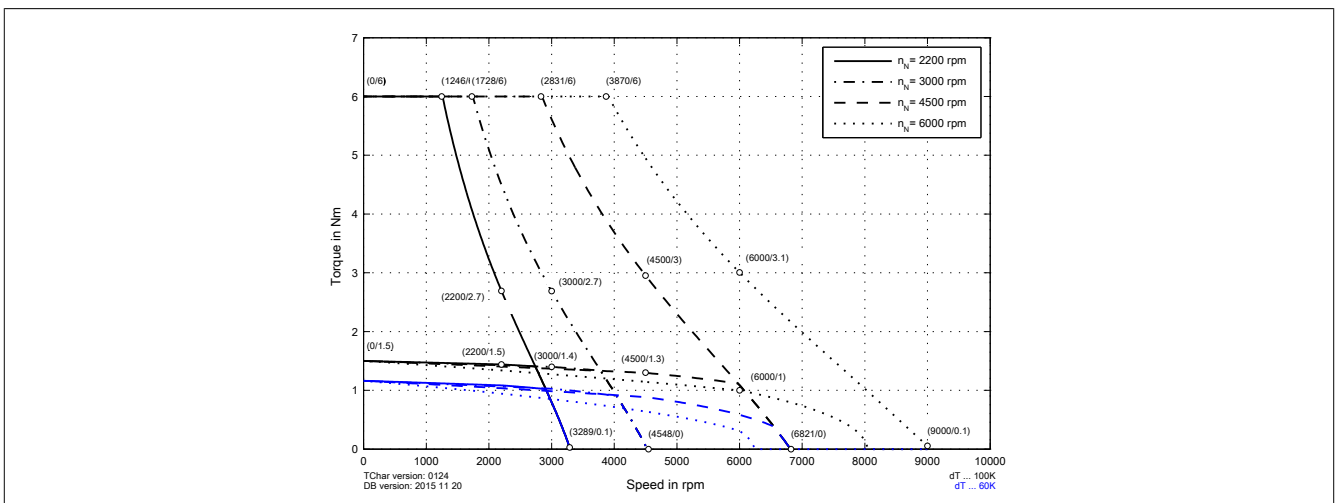


### 2.7.2.2 Speed-torque characteristics at DC bus voltage of 560 VDC

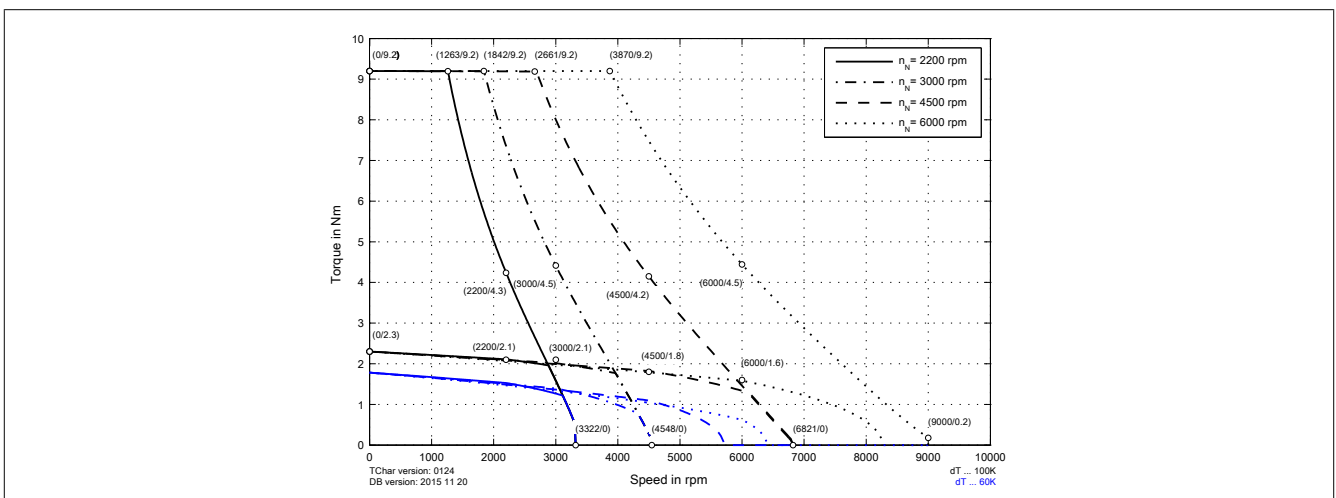
#### 8LSA33.eennffgg-3



#### 8LSA34.eennffgg-3

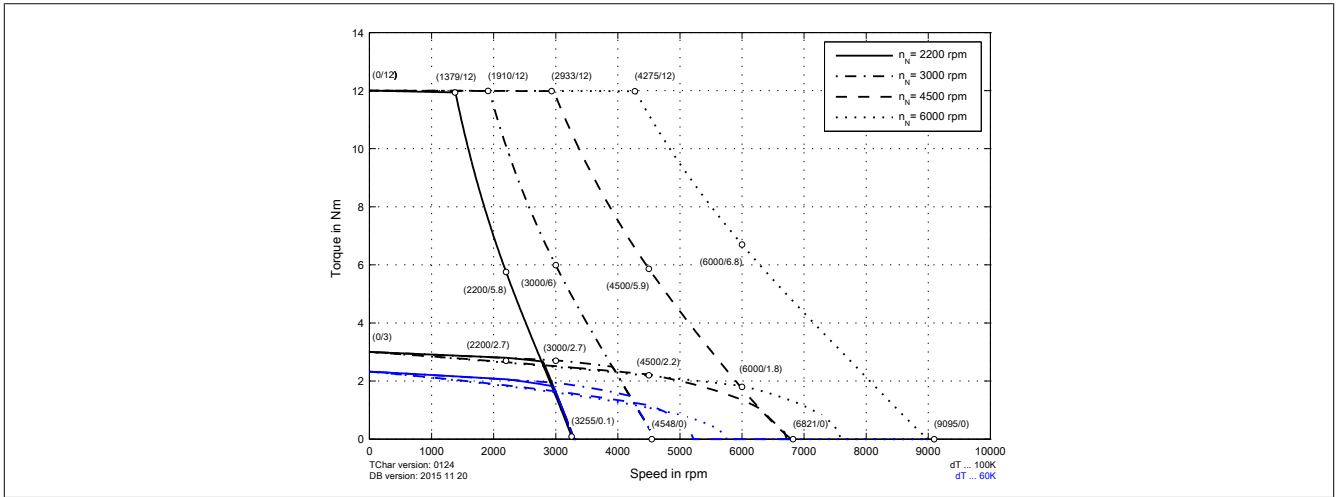


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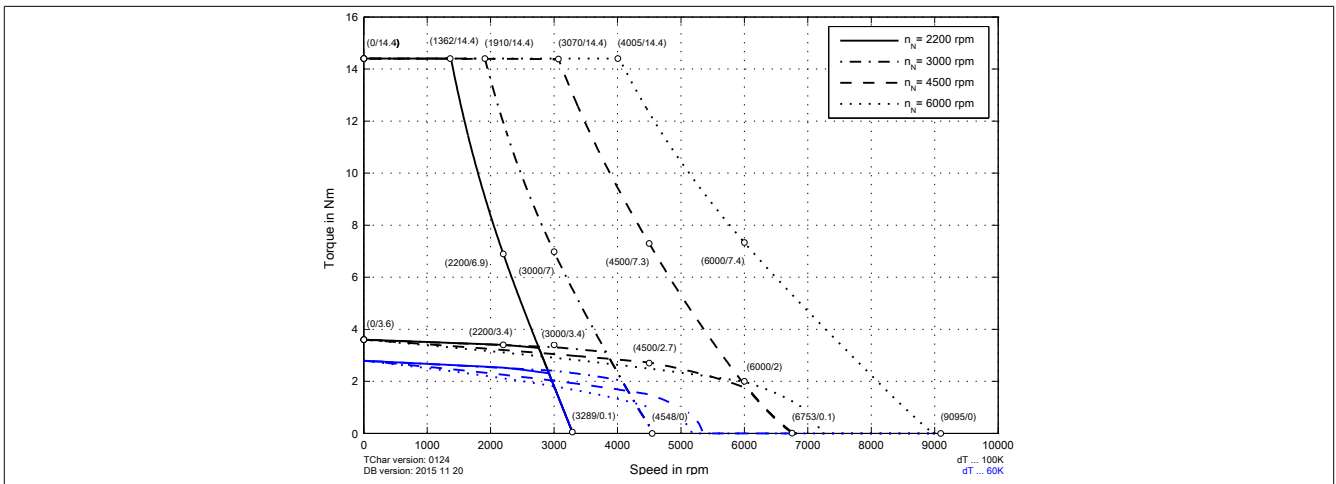




8LSA36.eennffgg-3

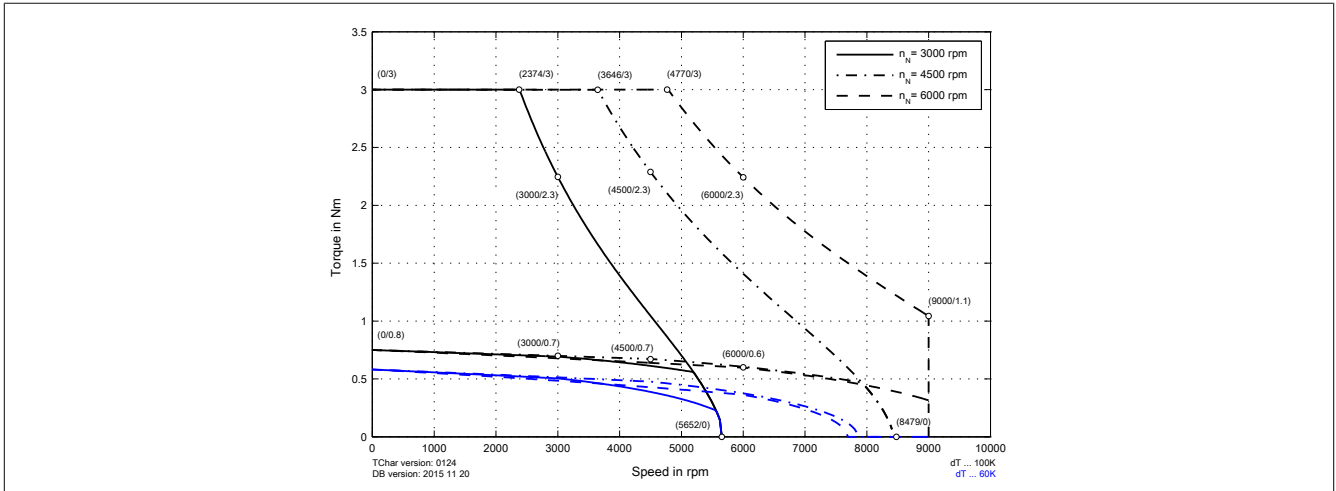


8LSA37.eennffgg-3

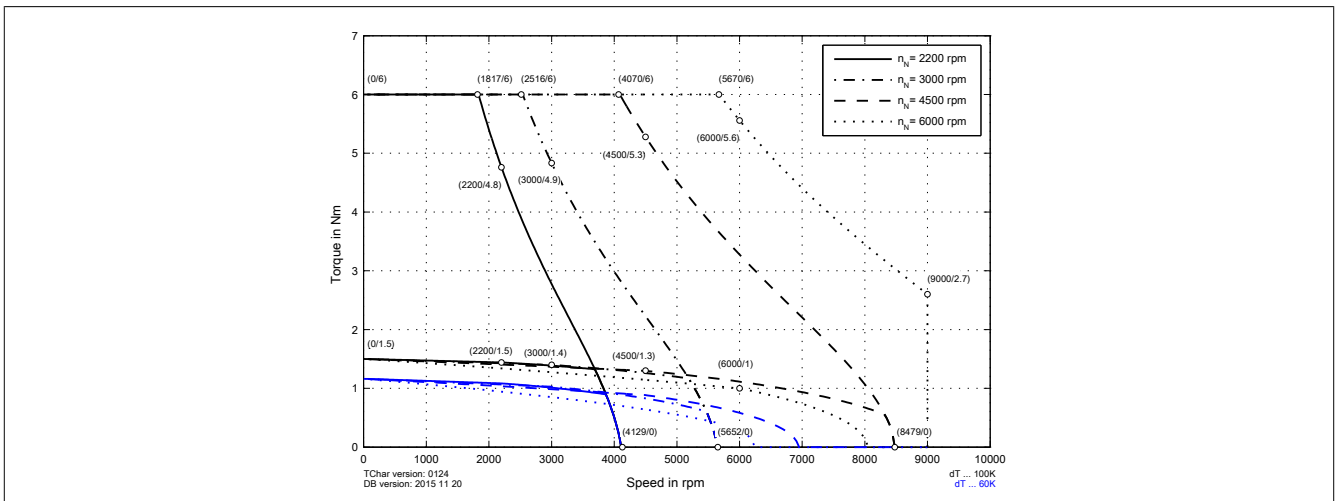


### 2.7.2.3 Speed-torque characteristics at DC bus voltage of 750 VDC

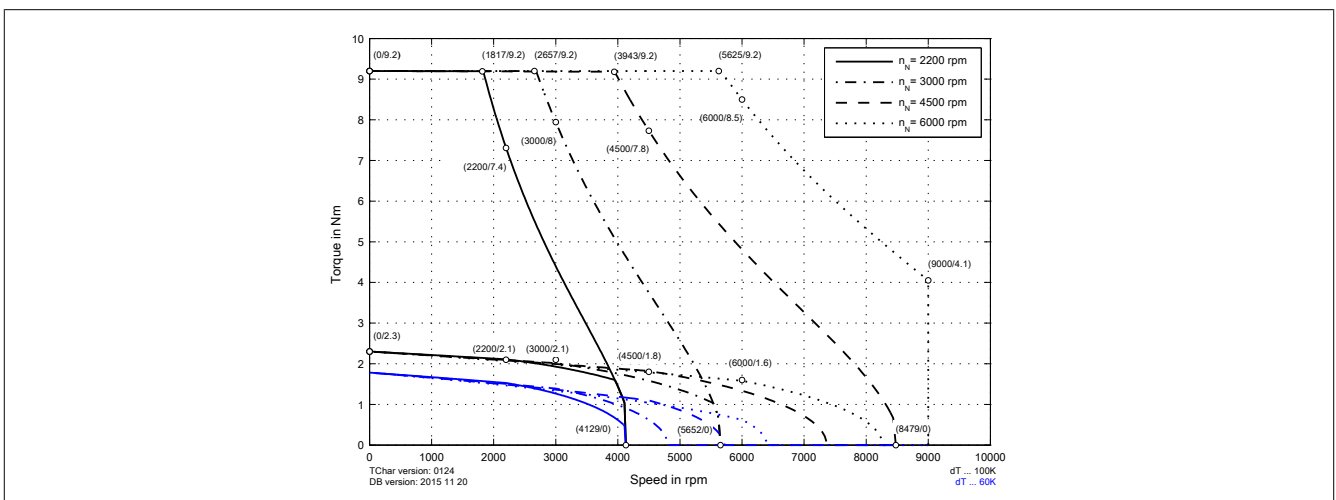
#### 8LSA33.eennffgg-3



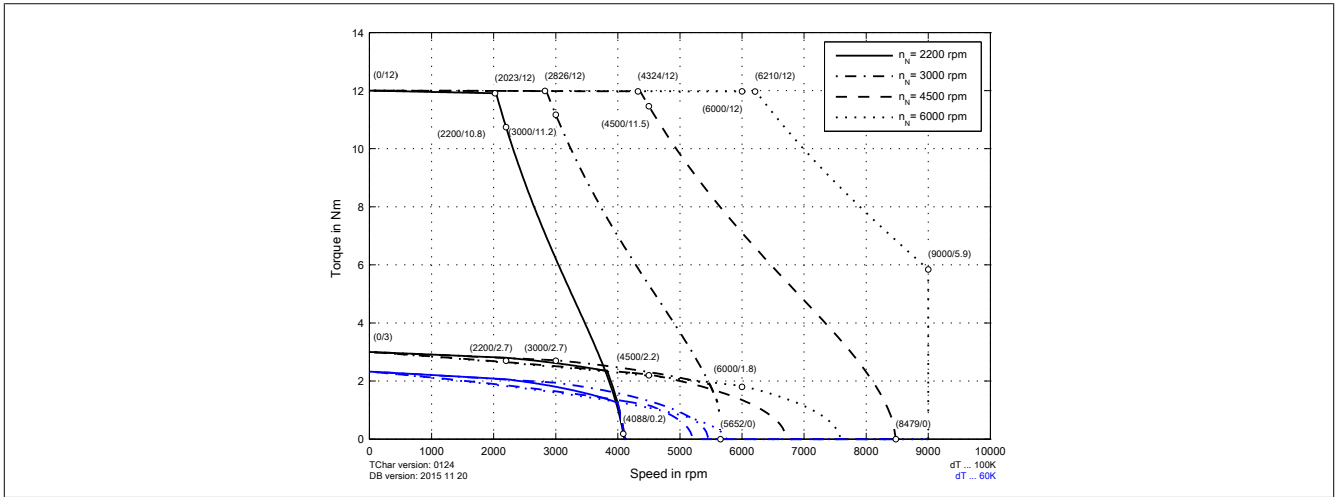
#### 8LSA34.eennffgg-3



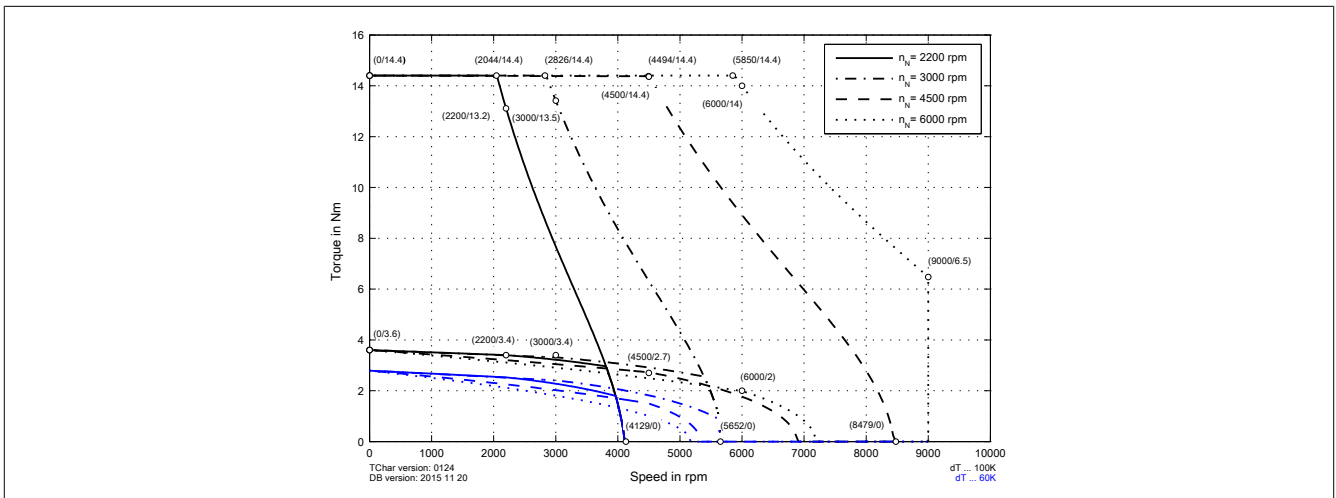
#### 8LSA35.eennffgg-3



8LSA36.eennffgg-3



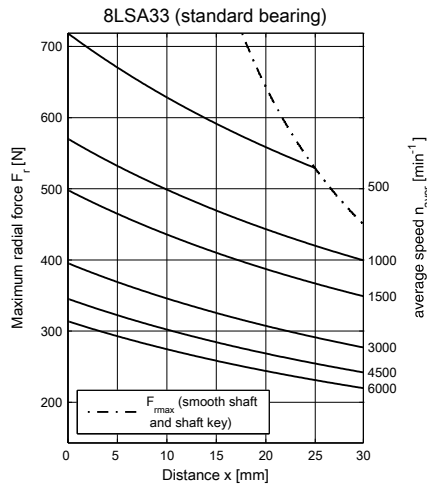
8LSA37.eennffgg-3



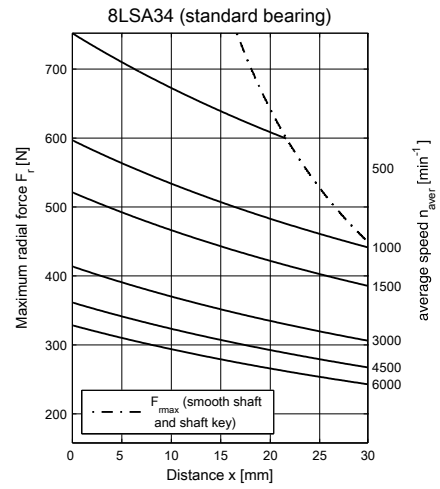
2.7.2.4 Permissible shaft load

2.7.2.4.1 8LSA3 V3 - Permissible shaft load

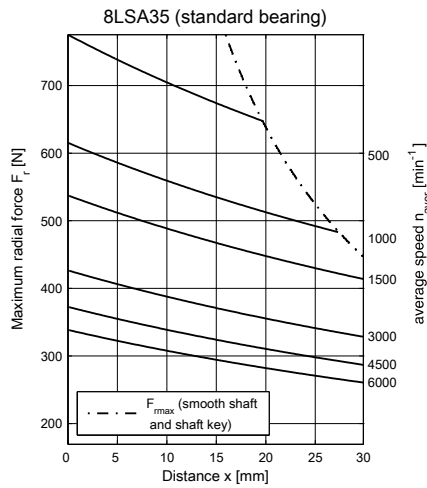
Standard bearings



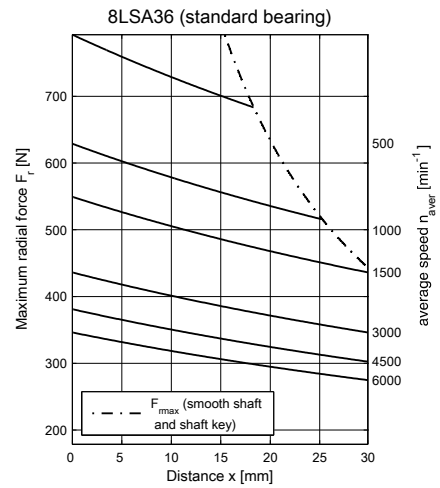
maximum allowed axial force:  $F_{amax} = 62 \text{ N}$



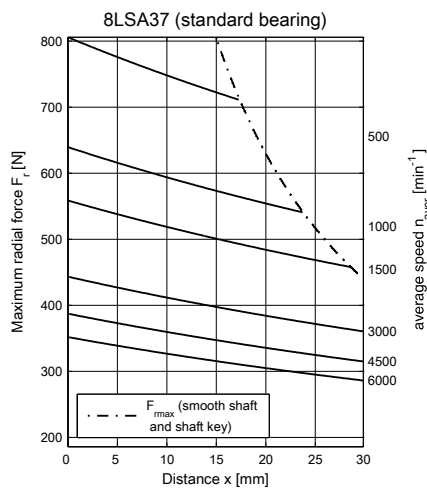
maximum allowed axial force:  $F_{amax} = 67 \text{ N}$



maximum allowed axial force:  $F_{amax} = 71 \text{ N}$

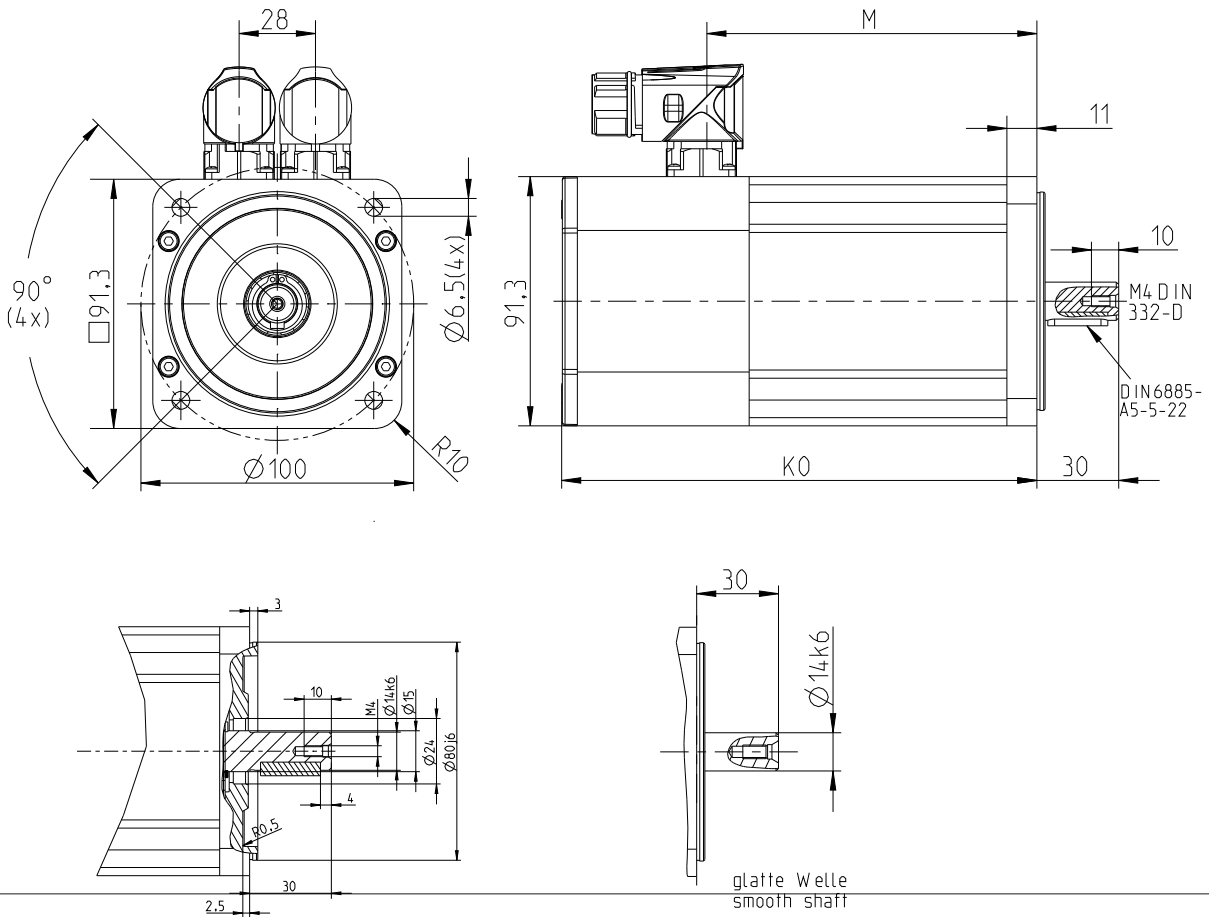


maximum allowed axial force:  $F_{amax} = 73 \text{ N}$



maximum allowed axial force:  $F_{amax} = 76 \text{ N}$

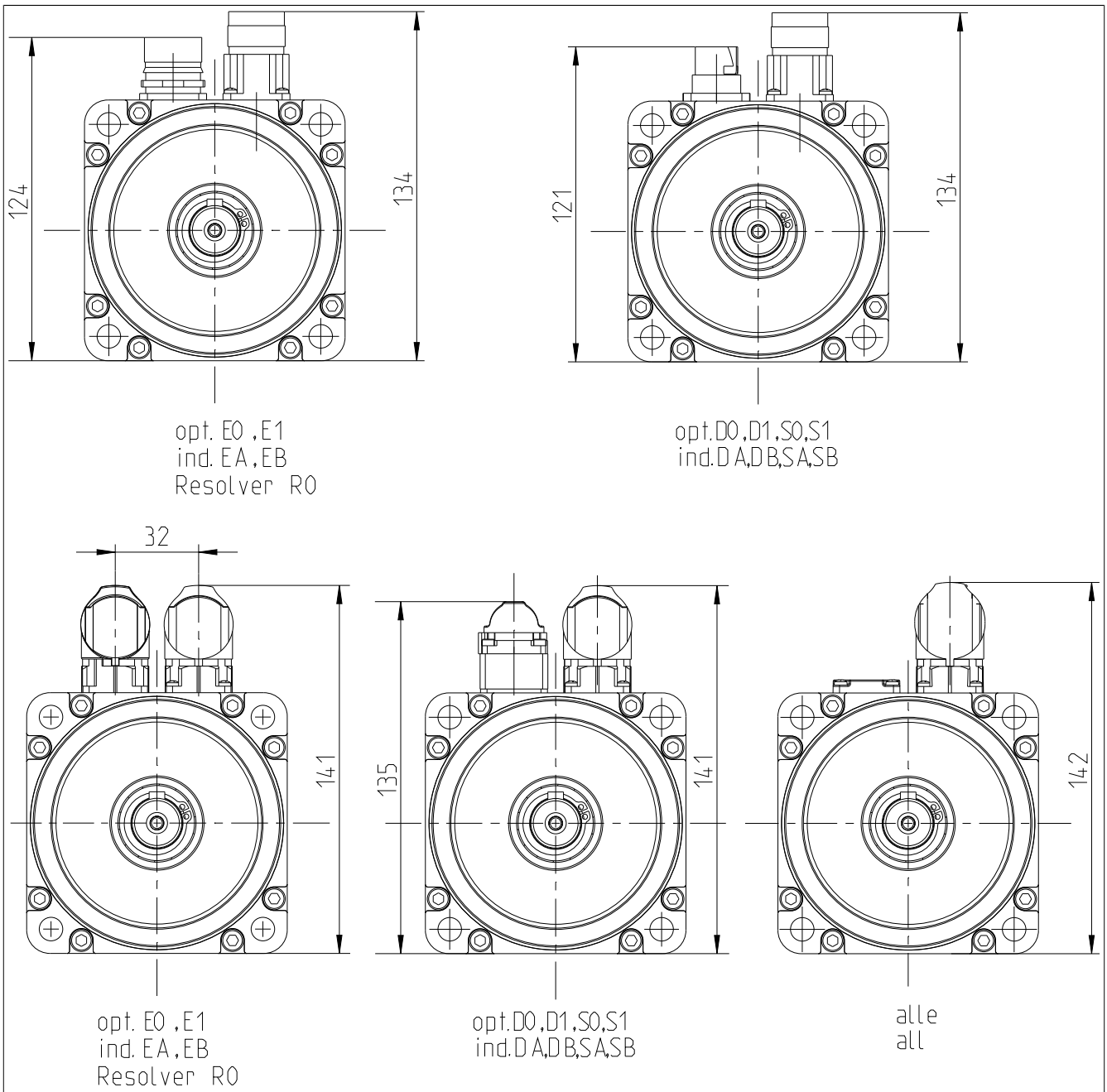
2.7.2.5 8LSA3 V3 - Dimensions



EnDat/Resolver feedback		Extension of $K_0$ and $M$ depending on the motor option [mm]		
Model number	$K_0$	$M$	Holding brake	Reinforced A-side bearing
8LSA33.eennffgg-3	144	93	35	---
8LSA34.eennffgg-3	159	108	35	---
8LSA35.eennffgg-3	174	123	35	---
8LSA36.eennffgg-3	189	138	35	---
8LSA37.eennffgg-3	204	153	35	---

Whether or not an oil seal is used has no effect on the length of the motor.

2.7.2.5.1 8LSA4 V3 - Connector options - Dimensions



## 2.7.3 Technical data - 8LSA4 V3

Model number	8LSA43. ee015ffgg-3	8LSA43. ee022ffgg-3	8LSA43. ee030ffgg-3	8LSA43. ee045ffgg-3	8LSA43. ee060ffgg-3	8LSA44. ee022ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	1500	2200	3000	4500	6000	2200
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	3.7	3.5	3.1	2.7	2	5.2
Nominal power $P_N$ [W]	581	806	974	1272	1257	1198
Nominal current $I_N$ [A]	1.1	1.6	1.9	2.49	2.5	2.3
Stall torque $M_0$ [Nm]	4					
Stall current $I_0$ [A]	1.2	1.8	2.5	3.7	4.9	2.7
Maximum torque $M_{max}$ [Nm]	15.2					
Maximum current $I_{max}$ [A]	7.29	10.71	14.59	21.9	29.2	16.1
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	3.26	2.22	1.63	1.08	0.81	2.22
Voltage constant $K_E$ [V/1000 rpm]	196.9	134	98.4	64.93	49.2	134
Stator resistance $R_{2ph}$ [ $\Omega$ ]	21.5	11.53	5.94	2.64	1.42	6.24
Stator inductance $L_{2ph}$ [mH]	145	81.1	36.5	16.5	9.2	44.8
Electrical time constant $t_{el}$ [ms]	6.7	7	6.1	6.3	6.5	7.2
Thermal time constant $t_{therm}$ [min]	25					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	1.87					
Mass without brake $m$ [kg]	4.5					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	0.78	1				
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1016	1022	1045		1090	1045
ACOPOS multi inverter module 8BVxxxx...	0014	0028		0055		0028
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 54: 8LSA43.ee015ffgg-3, 8LSA43.ee022ffgg-3, 8LSA43.ee030ffgg-3, 8LSA43.ee045ffgg-3, 8LSA43.ee060ffgg-3, 8LSA44.ee022ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA44. ee011ffgg-3	8LSA44. ee015ffgg-3	8LSA44. ee022ffgg-3	8LSA44. ee030ffgg-3	8LSA44. ee045ffgg-3	8LSA44. ee060ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	1100	1500	2200	3000	4500	6000
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	5.6	5.5	5.2	4.62	3.6	3
Nominal power $P_N$ [W]	645	864	1198	1451	1696	1885
Nominal current $I_N$ [A]	1.3	1.69	2.3	2.8	3.3	3.7
Stall torque $M_0$ [Nm]	6					
Stall current $I_0$ [A]	1.4	1.8	2.7	3.7	5.5	7.4
Maximum torque $M_{max}$ [Nm]	22.8					
Maximum current $I_{max}$ [A]	8	10.9	16.1	21.9	32.91	43.8
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	4.43	3.26	2.22	1.63	1.08	0.81
Voltage constant $K_E$ [V/1000 rpm]	268.1	196.9	134	98.4	64.93	49.2
Stator resistance $R_{zph}$ [ $\Omega$ ]	27.4	13	6.24	3.6	1.6	0.862
Stator inductance $L_{zph}$ [mH]	180.4	81	44.8	24	10.8	6.2
Electrical time constant $t_{el}$ [ms]	6.6	6.2	7.2	6.7	6.8	7.2
Thermal time constant $t_{therm}$ [min]	30					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73					
Mass without brake $m$ [kg]	5.4					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1016	1022	1045		1090	
ACOPOS multi inverter module 8BVxxxx...	0014	0028		0055		0110
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 55: 8LSA44.ee011ffgg-3, 8LSA44.ee015ffgg-3, 8LSA44.ee022ffgg-3, 8LSA44.ee030ffgg-3, 8LSA44.ee045ffgg-3, 8LSA44.ee060ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.



Model number	8LSA45.ee015ffgg-3	8LSA45.ee022ffgg-3	8LSA45.ee030ffgg-3	8LSA45.ee045ffgg-3	8LSA45.ee060ffgg-3
<b>Motor</b>					
Nominal speed $n_N$ [rpm]	1500	2200	3000	4500	6000
Number of pole pairs	5				
Nominal torque $M_N$ [Nm]	7.4	7	6.16	4.8	4
Nominal power $P_N$ [W]	1162	1613	1935	2262	2513
Nominal current $I_N$ [A]	2.3	3.2	3.8	4.4	4.91
Stall torque $M_0$ [Nm]	8				
Stall current $I_0$ [A]	2.5	3.6	4.9	7.4	9.8
Maximum torque $M_{max}$ [Nm]	30.4				
Maximum current $I_{max}$ [A]	14.59	21.4	29.2	43.9	58.3
Maximum speed $n_{max}$ [rpm]	12000				
Torque constant $K_T$ [Nm/A]	3.26	2.22	1.63	1.08	0.81
Voltage constant $K_E$ [V/1000 rpm]	196.9	134	98.4	64.93	49.2
Stator resistance $R_{zph}$ [ $\Omega$ ]	9.9	4.32	2.489	1.106	0.6
Stator inductance $L_{zph}$ [mH]	86	41	21.8	9.69	5.4
Electrical time constant $t_{el}$ [ms]	8.7	9.5	8.8		9
Thermal time constant $t_{therm}$ [min]	35				
Moment of inertia $J$ [kgcm <sup>2</sup> ]	3.58				
Mass without brake $m$ [kg]	6.5				
<b>Holding brake</b>					
Holding torque of the brake $M_{Br}$ [Nm]	8				
Brake mass [kg]	0.9				
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54				
<b>Recommendations</b>					
ACOPOS servo drive 8Vxxxx.xx...	1045		1090		1180
ACOPOS multi inverter module 8BVlxxxx...	0028	0055		0110	
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75				
Connector type	speedtec				
Connector size	1.0				

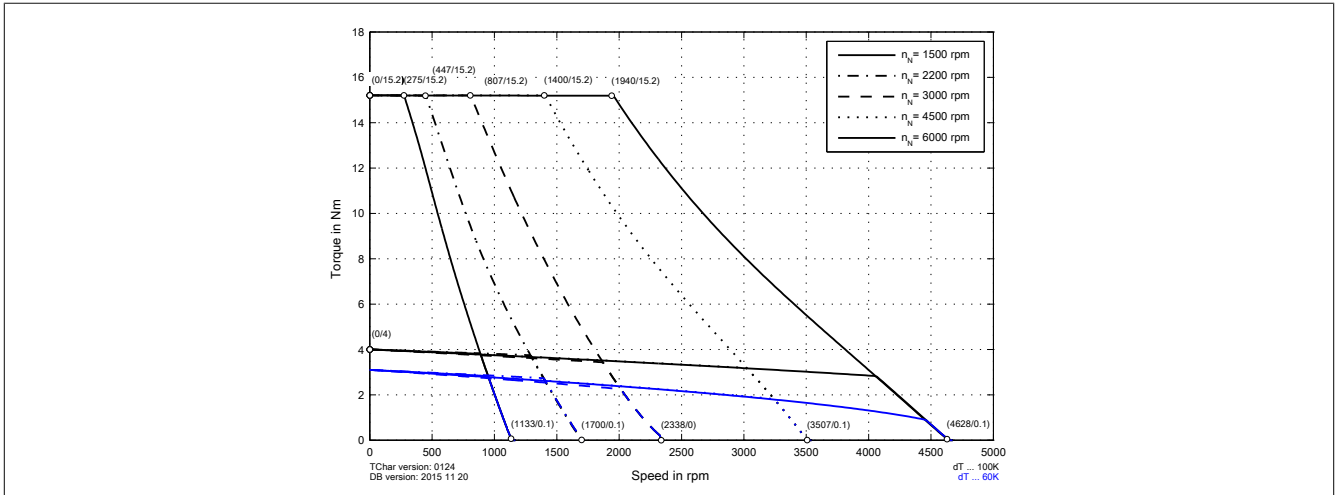
Table 56: 8LSA45.ee015ffgg-3, 8LSA45.ee022ffgg-3, 8LSA45.ee030ffgg-3, 8LSA45.ee045ffgg-3, 8LSA45.ee060ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

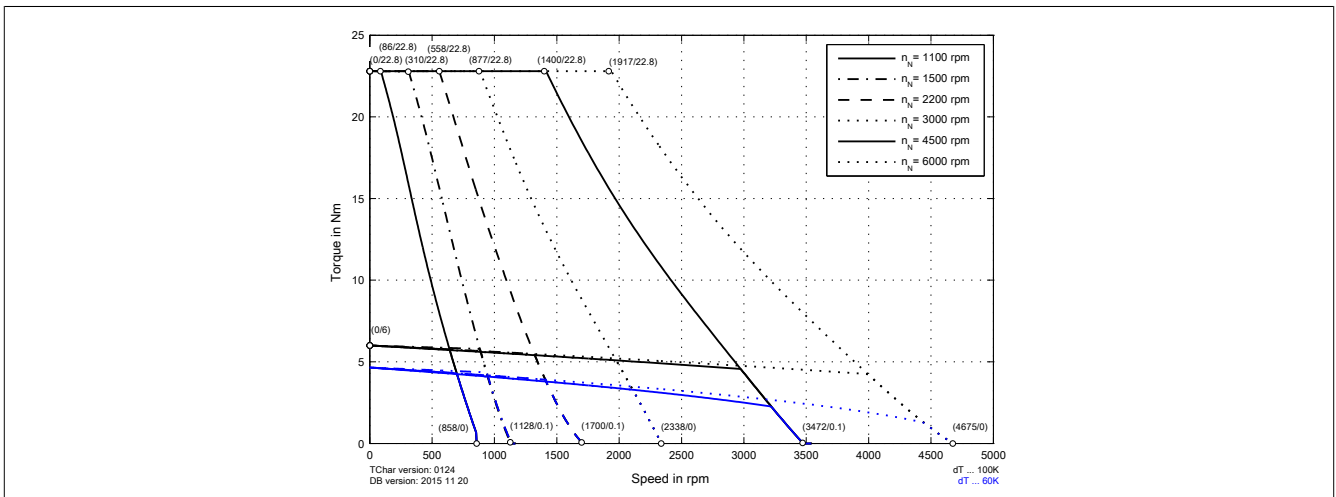
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

### 2.7.3.1 Speed-torque characteristics at DC bus voltage of 325 VDC

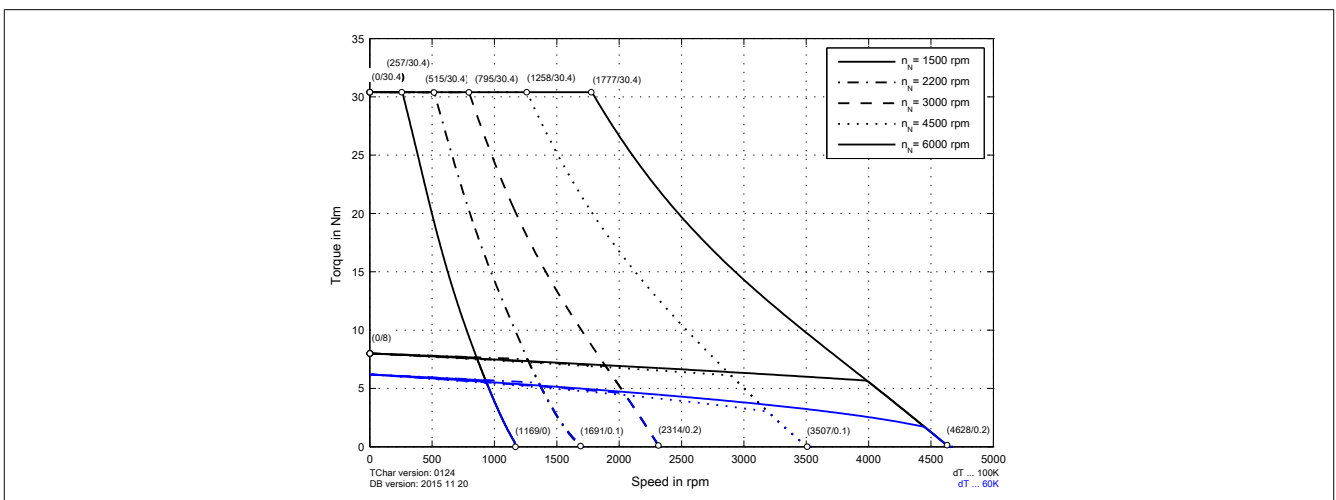
#### 8LSA43.eennffgg-3



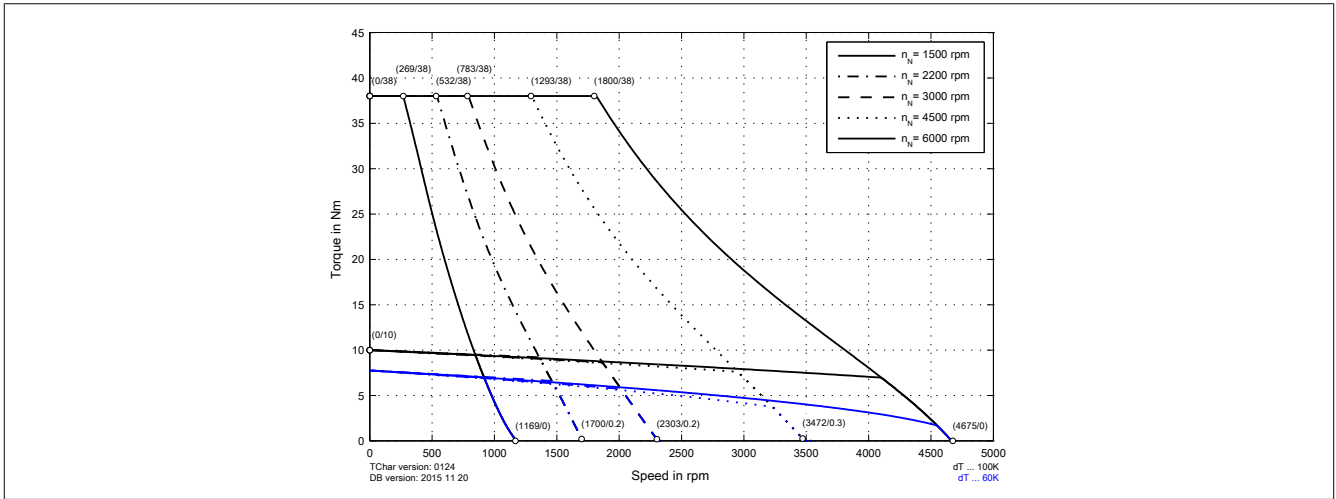
#### 8LSA44.eennffgg-3



#### 8LSA45.eennffgg-3

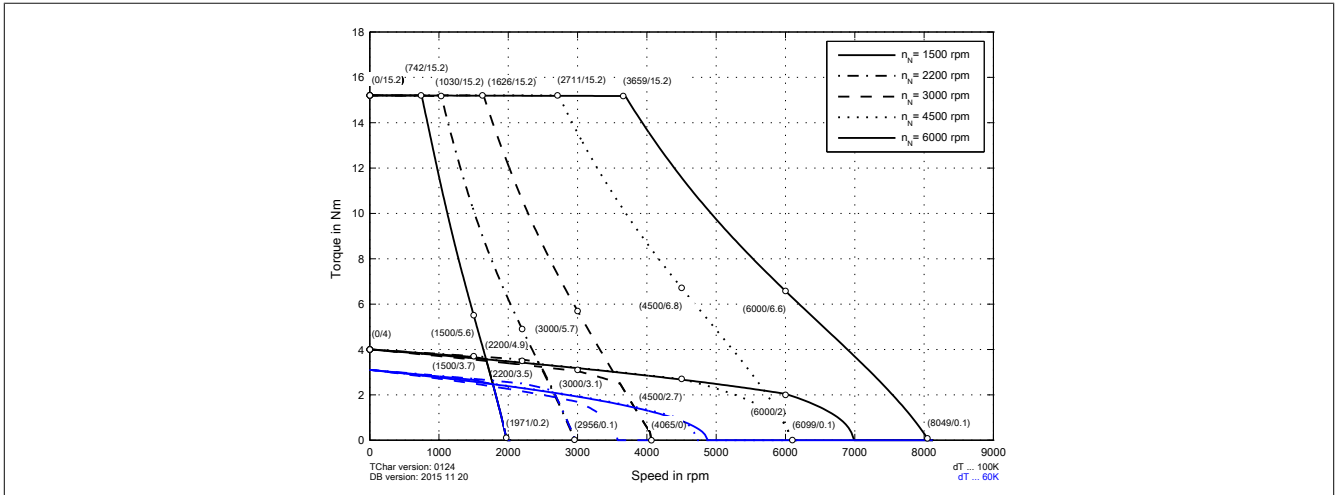


8LSA46.eennffgg-3

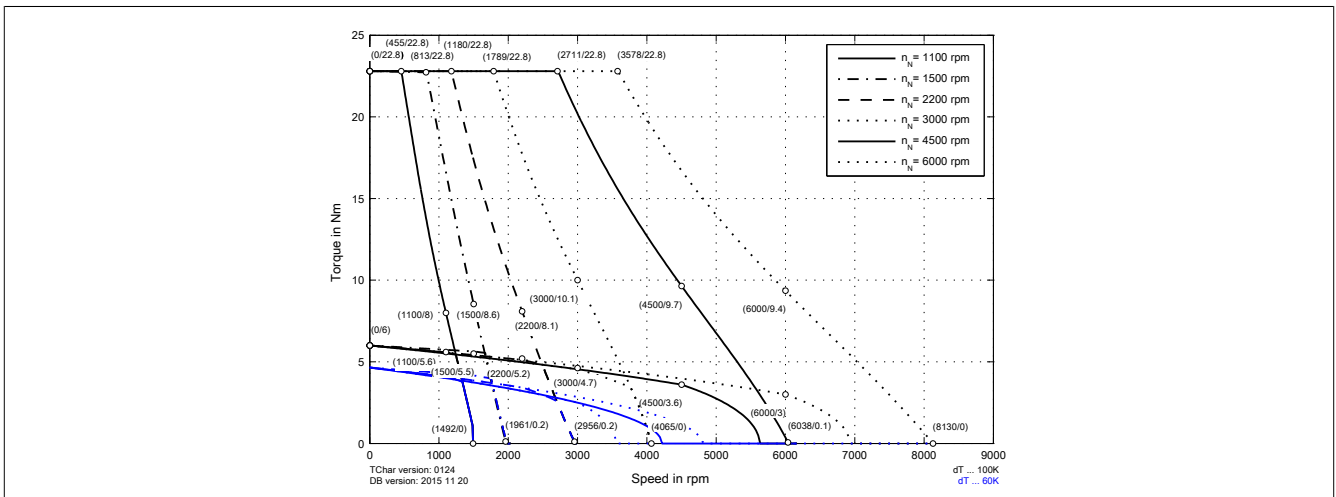


### 2.7.3.2 Speed-torque characteristics at DC bus voltage of 560 VDC

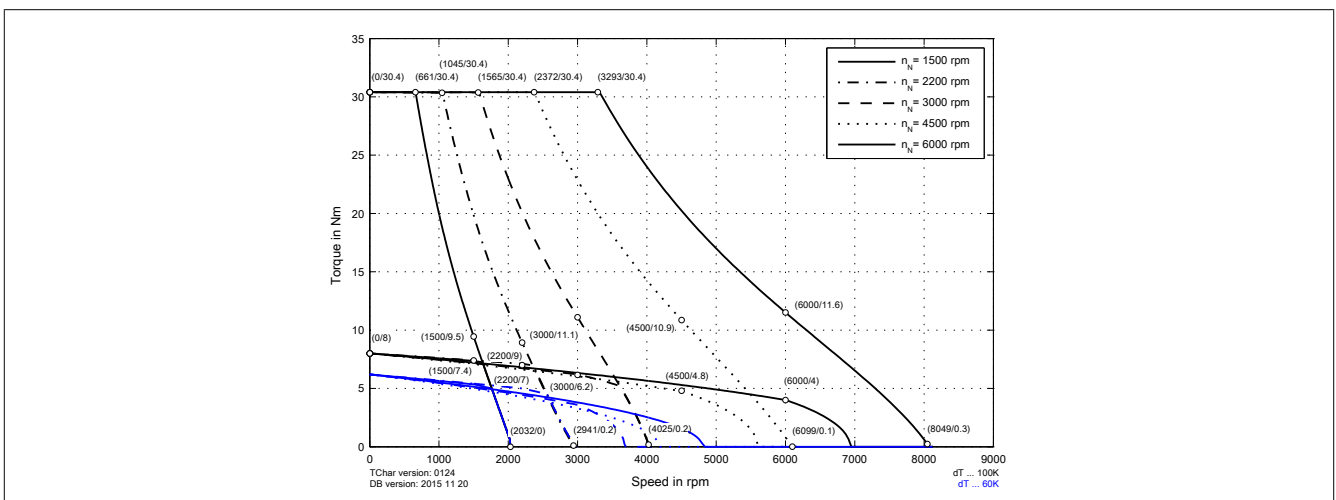
#### 8LSA43.eennffgg-3



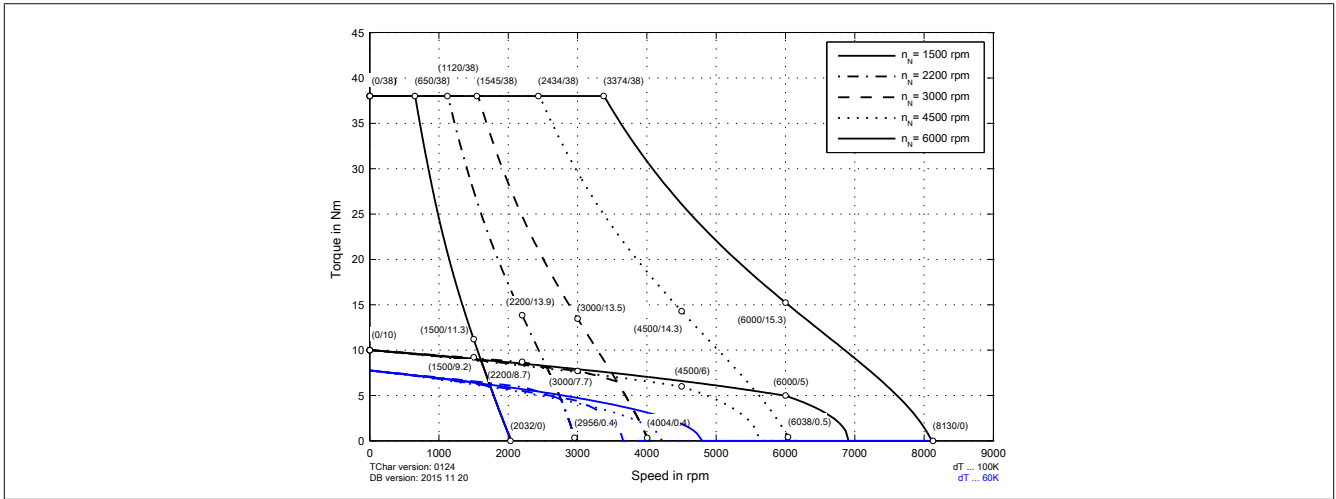
#### 8LSA44.eennffgg-3



#### 8LSA45.eennffgg-3

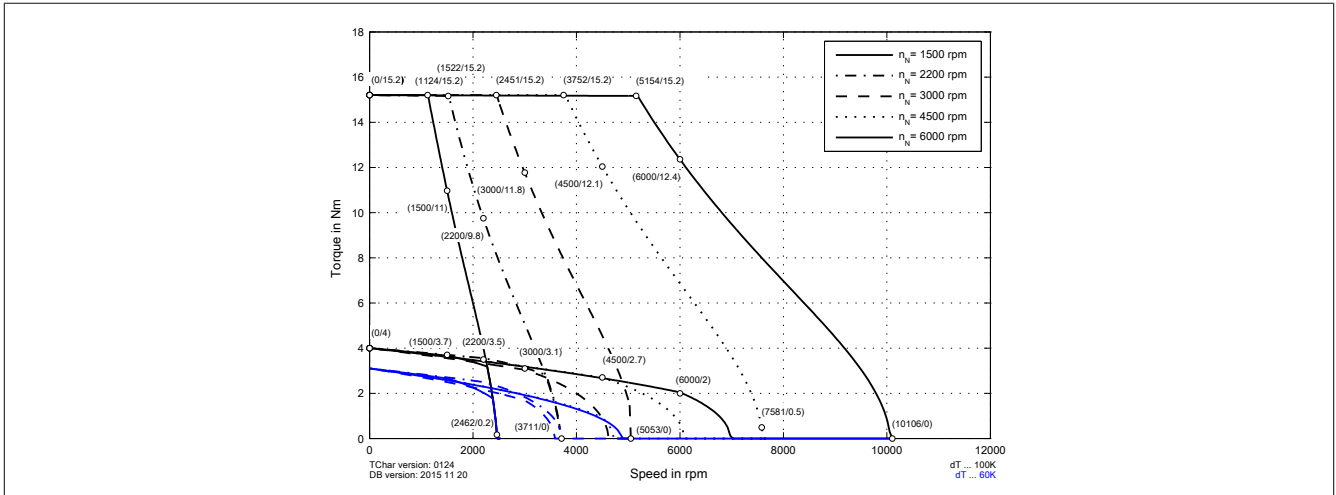


8LSA46.eennffgg-3

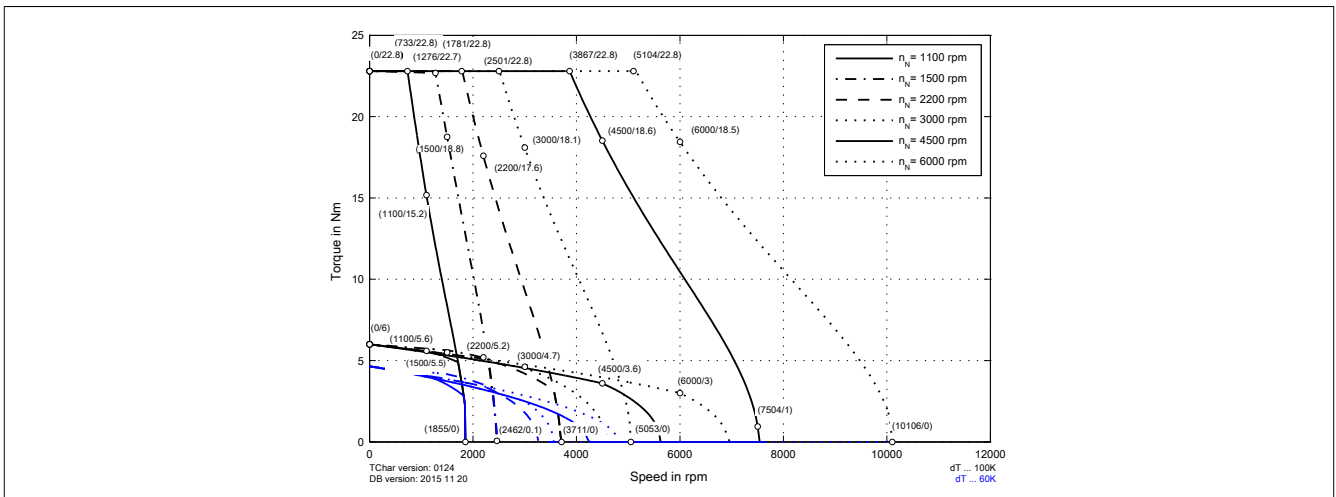


### 2.7.3.3 Speed-torque characteristics at DC bus voltage of 750 VDC

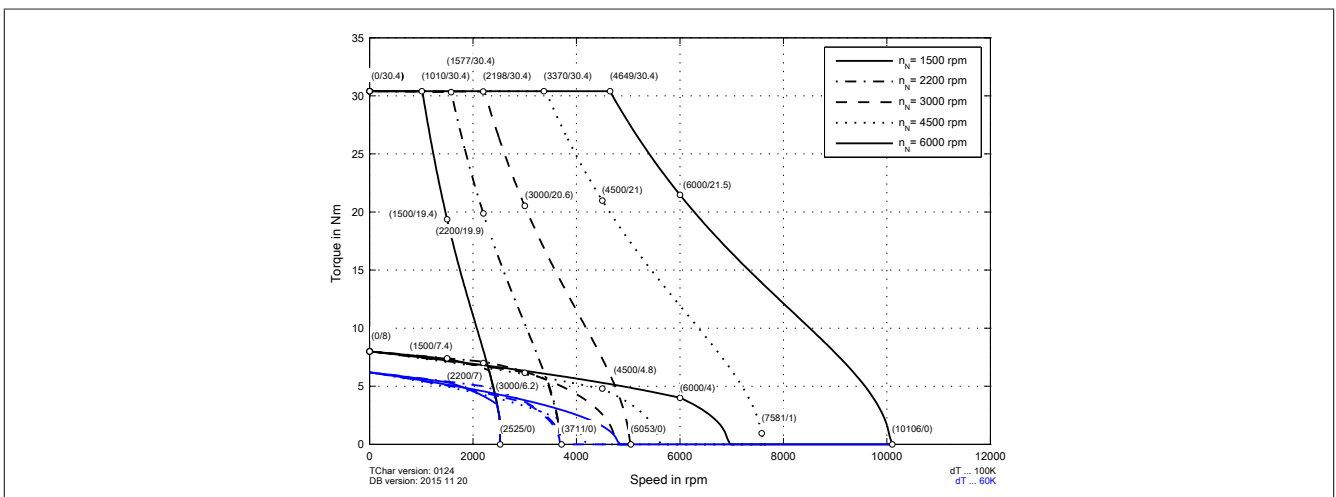
#### 8LSA43.eennffgg-3



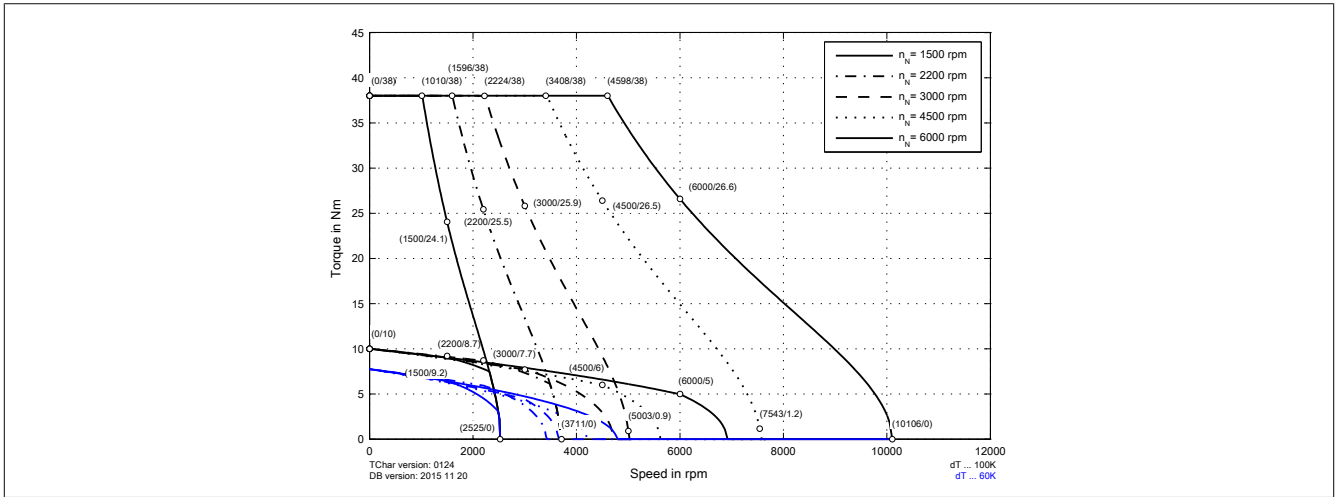
#### 8LSA44.eennffgg-3



#### 8LSA45.eennffgg-3



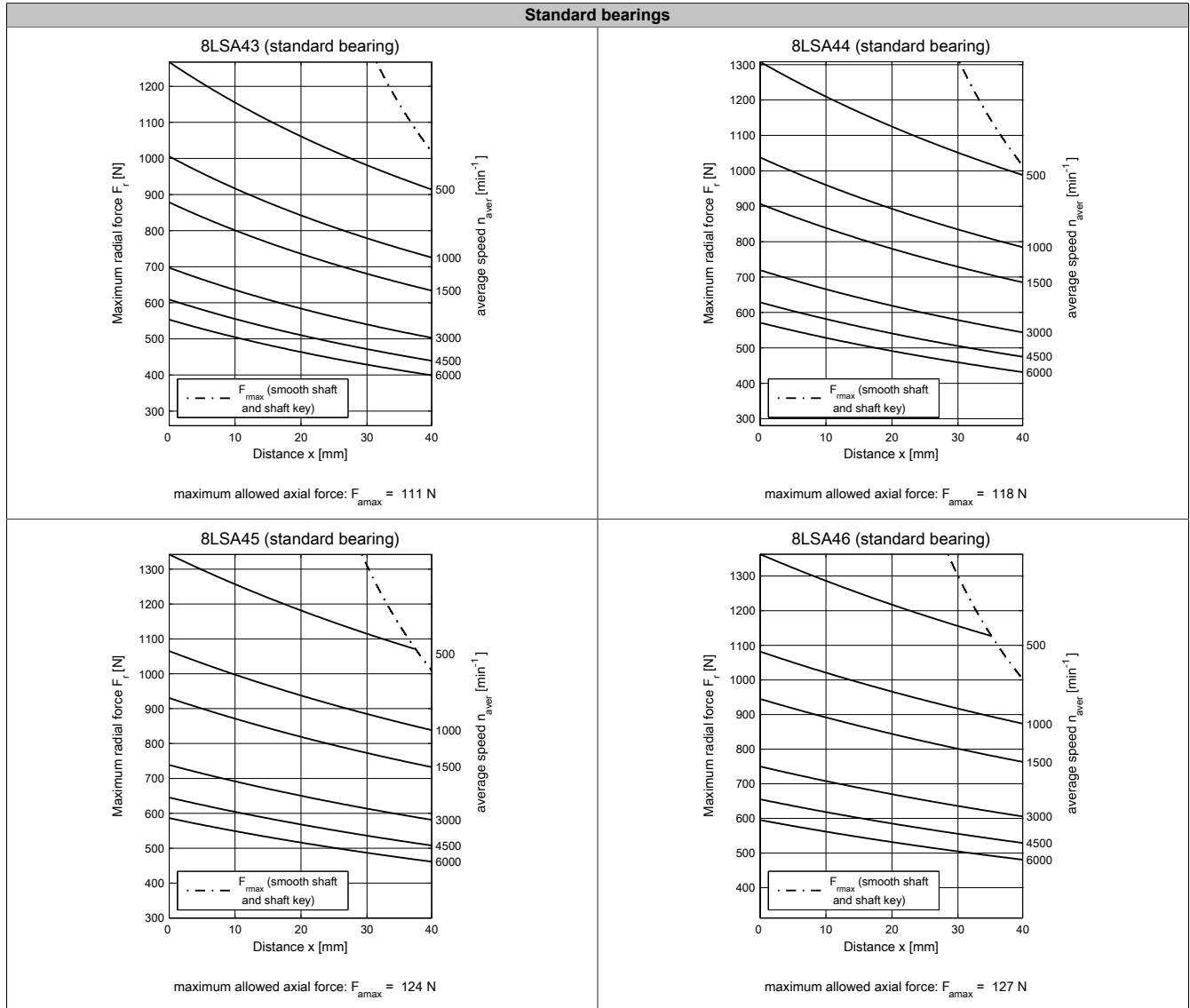
8LSA46.eennffgg-3



### 2.7.3.4 Permissible shaft load

#### 2.7.3.4.1 8LSA/C4 V3 - Permissible shaft load

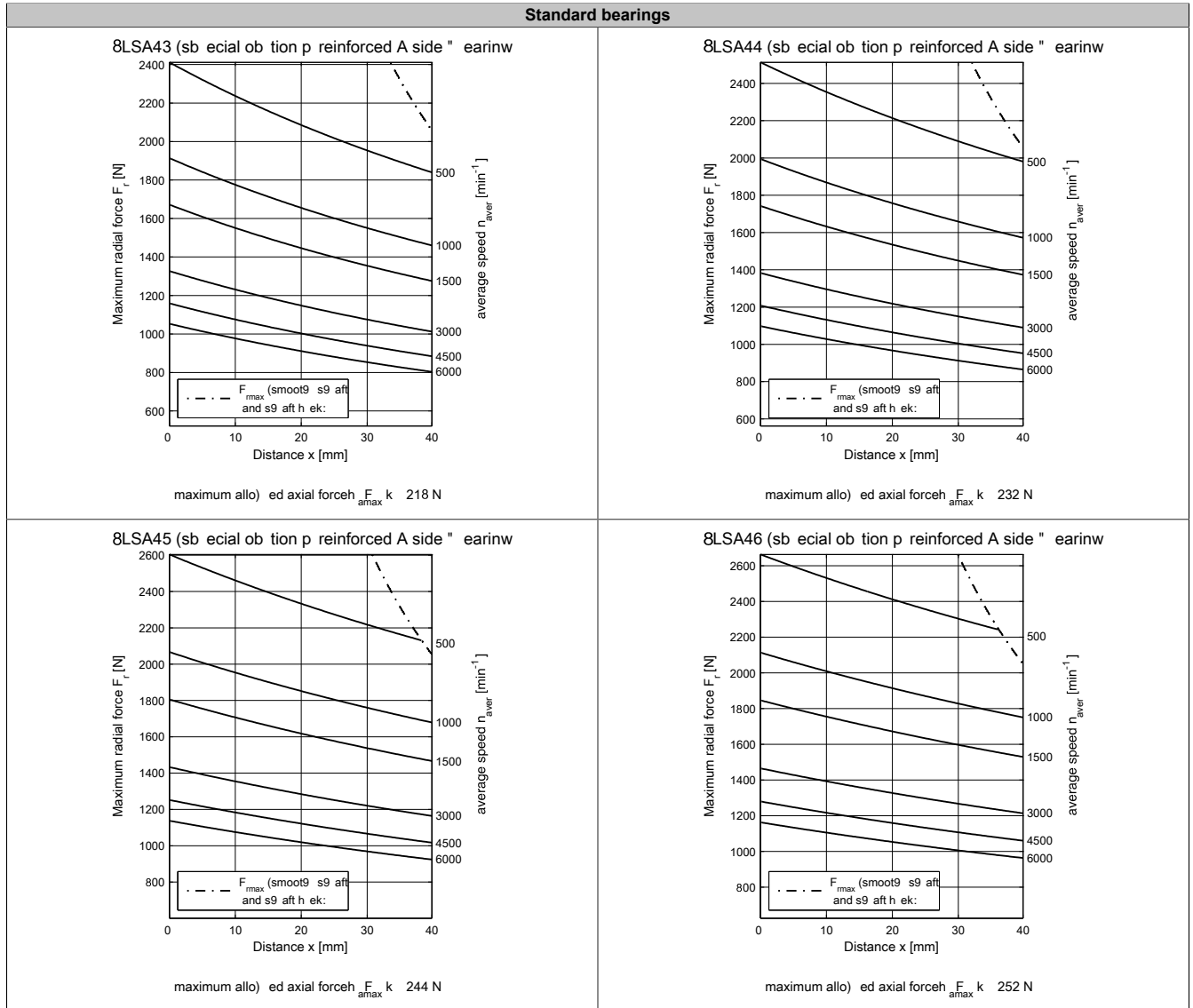
Shaft load values apply to both 8LSA and 8LSC!



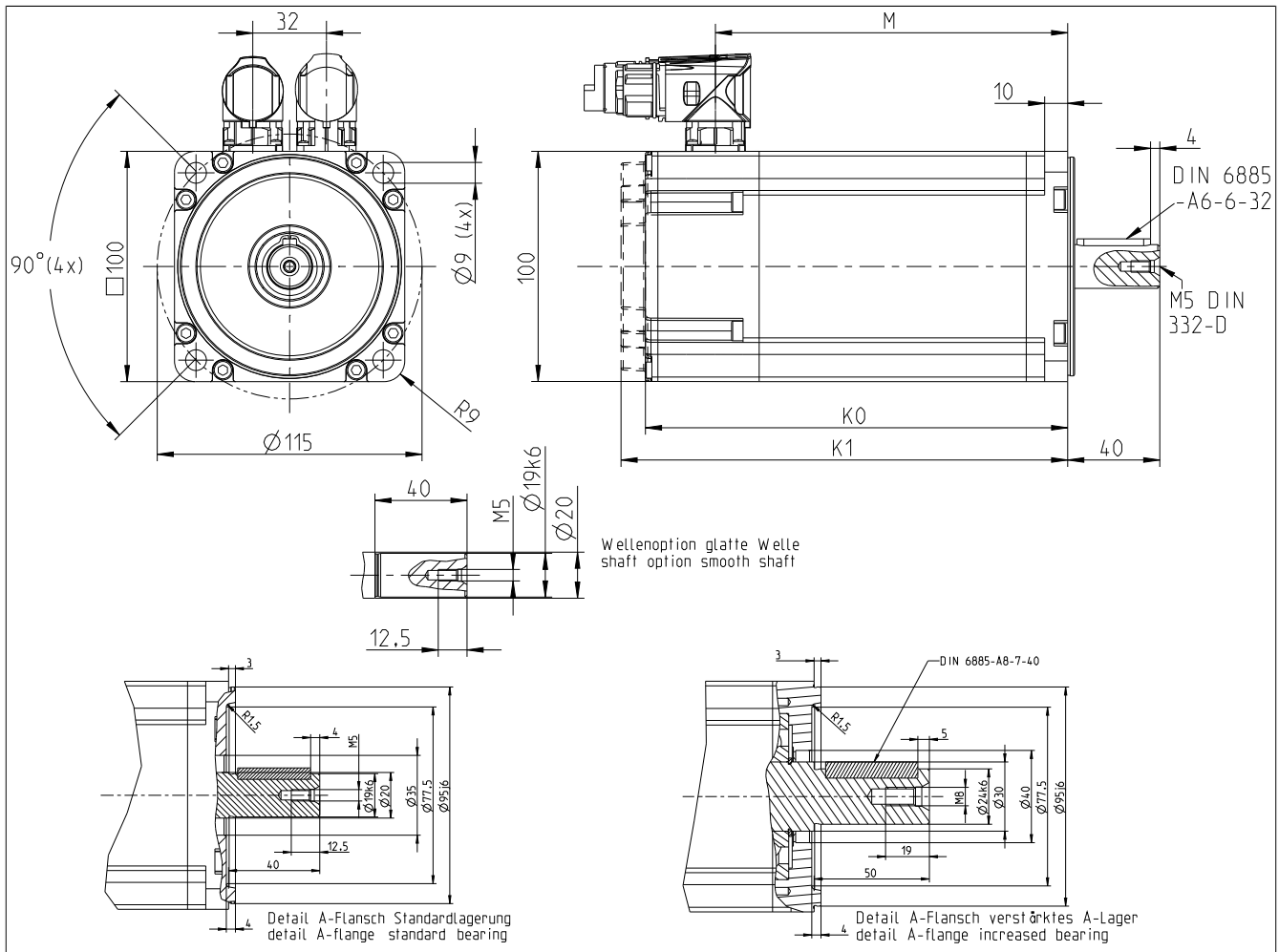


2.7.3.4.2 8LSA/C4 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!



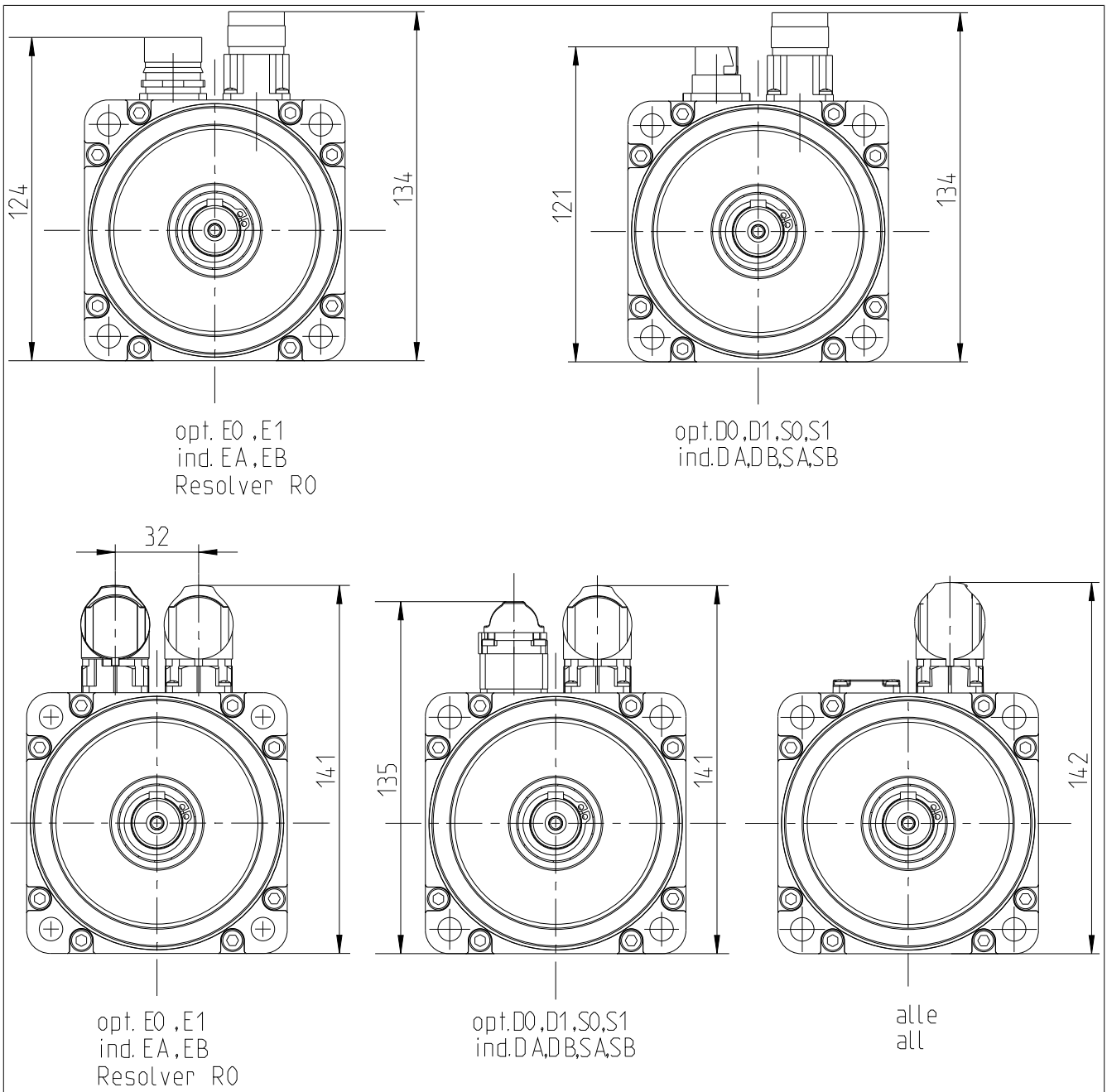
2.7.3.5 8LSA4 Version 3 - Dimensions



EnDat / resolver feedback				Extension of $K_0$ , $K_1$ and $M$ depending on the motor option [mm]		
Encoder assignments	DA,DB,EA,EB,SA,SB,R2	D0,D1,E0,E1,S0,S1		Holding brake	Heavy duty holding brake	Reinforced A side bearing
Model number	$K_0$	$K_1$	$M$			
8LSA43.eennffgg-3	163	174	133	32	37	15
8LSA44.eennffgg-3	183	194	153	32	37	15
8LSA45.eennffgg-3	207	218	177	32	37	15
8LSA46.eennffgg-3	227	238	197	32	37	15

Whether or not an oil seal is used has no effect on the length of the motor.

2.7.3.5.1 8LSA4 V3 - Connector options - Dimensions



## 2.7.4 Technical data - 8LSA5 V3

Model number	8LSA53. ee020ffgg-3	8LSA53. ee022ffgg-3	8LSA53. ee030ffgg-3	8LSA53. ee045ffgg-3	8LSA54. ee011ffgg-3	8LSA54. ee020ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2000	2200	3000	4500	1100	2000
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	4.2		4	3.9	8.4	8.1
Nominal power $P_N$ [W]	880	968	1257	1838	968	1696
Nominal current $I_N$ [A]	1.7	1.9	2.5	3.6	1.9	3.3
Stall torque $M_0$ [Nm]	4.5				9	
Stall current $I_0$ [A]	1.8	2	2.8	4.1	2	3.7
Maximum torque $M_{max}$ [Nm]	13.8				27.6	
Maximum current $I_{max}$ [A]	7.3	8	10.5	16.5	8	14.6
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	2.44	2.22	1.63	1.09	4.47	2.44
Voltage constant $K_E$ [V/1000 rpm]	147.65	134.04	98.44	65.97	270.18	147.65
Stator resistance $R_{zph}$ [ $\Omega$ ]	11.313	10.9	5.13	2.222	14.88	4.026
Stator inductance $L_{zph}$ [mH]	98.98	95.92	40.33	19.33	145.7	44.37
Electrical time constant $t_{el}$ [ms]	8.7	8.8	7.9	8.7	10	11
Thermal time constant $t_{therm}$ [min]	33				37	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	3.62				6.04	
Mass without brake $m$ [kg]	6.2				8.5	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15					
Brake mass [kg]	1.49				1.43	
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1022		1045	1090	1022	1045
ACOPOS multi inverter module 8BVlxxxx...	0028			0055	0028	0055
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 57: 8LSA53.ee020ffgg-3, 8LSA53.ee022ffgg-3, 8LSA53.ee030ffgg-3, 8LSA53.ee045ffgg-3, 8LSA54.ee011ffgg-3, 8LSA54.ee020ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA54. ee011ffgg-3	8LSA54. ee020ffgg-3	8LSA54. ee022ffgg-3	8LSA54. ee030ffgg-3	8LSA54. ee045ffgg-3	8LSA55. ee020ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	1100	2000	2200	3000	4500	2000
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	8.4	8.1	7.8	7.7	7.3	11.8
Nominal power $P_N$ [W]	968	1696	1797	2419	3440	2471
Nominal current $I_N$ [A]	1.9	3.3	3.5	4.7	6.7	4.8
Stall torque $M_0$ [Nm]	9					
Stall current $I_0$ [A]	2	3.7	4.1	5.5	8.2	5.1
Maximum torque $M_{max}$ [Nm]	27.6					
Maximum current $I_{max}$ [A]	8	14.6	15.4	20.9	33	20.9
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	4.47	2.44	2.22	1.63	1.09	2.44
Voltage constant $K_E$ [V/1000 rpm]	270.18	147.65	134.04	98.44	65.97	147.65
Stator resistance $R_{zph}$ [ $\Omega$ ]	14.88	4.026	3.44	2.16	0.926	2.51
Stator inductance $L_{zph}$ [mH]	145.7	44.37	34.5	21.52	8.67	24.5
Electrical time constant $t_{el}$ [ms]	10	11	10	10.6	10.9	9.8
Thermal time constant $t_{therm}$ [min]	37					
Moment of inertia $J$ [kgcm <sup>2</sup> ]	6.04					
Mass without brake $m$ [kg]	8.5					
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15					
Brake mass [kg]	1.43					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1022	1045	1090		1180	1090
ACOPOS multi inverter module 8BVxxxx...	0028	0055			0110	0055
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 58: 8LSA54.ee011ffgg-3, 8LSA54.ee020ffgg-3, 8LSA54.ee022ffgg-3, 8LSA54.ee030ffgg-3, 8LSA54.ee045ffgg-3, 8LSA55.ee020ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA55. ee022ffgg-3	8LSA55. ee030ffgg-3	8LSA55. ee045ffgg-3	8LSA56. ee015ffgg-3	8LSA56. ee020ffgg-3	8LSA56. ee022ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2200	3000	4500	1500	2000	2200
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	11.8	11.6	9.5	15.2	15.1	14.4
Nominal power $P_N$ [W]	2719	3644	4477	2388	3163	3318
Nominal current $I_N$ [A]	5.3	7.1	8.7	4.7	6.2	6.5
Stall torque $M_0$ [Nm]	12.5				16	
Stall current $I_0$ [A]	5.6	7.7	11.5	4.9	6.6	7.2
Maximum torque $M_{max}$ [Nm]	41.4				55.2	
Maximum current $I_{max}$ [A]	23.6	33	47.3	21.8	29.1	30.8
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.09	3.25	2.44	2.22
Voltage constant $K_E$ [V/1000 rpm]	134.04	98.44	65.97	196.87	147.65	134.04
Stator resistance $R_{zph}$ [ $\Omega$ ]	2.265	1.127	0.51	3.13	1.731	1.51
Stator inductance $L_{zph}$ [mH]	24.29	12.5	4.96	35.02	20.91	17.6
Electrical time constant $t_{el}$ [ms]	10.7	11.1	9.7	11.2	12.1	11.6
Thermal time constant $t_{therm}$ [min]	40				43	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	8.19				10.66	
Mass without brake $m$ [kg]	10.4				13	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15					
Brake mass [kg]	1.47				1.44	
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090		1180		1090	
ACOPOS multi inverter module 8BVxxxx...	0055	0110		0055		0110
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

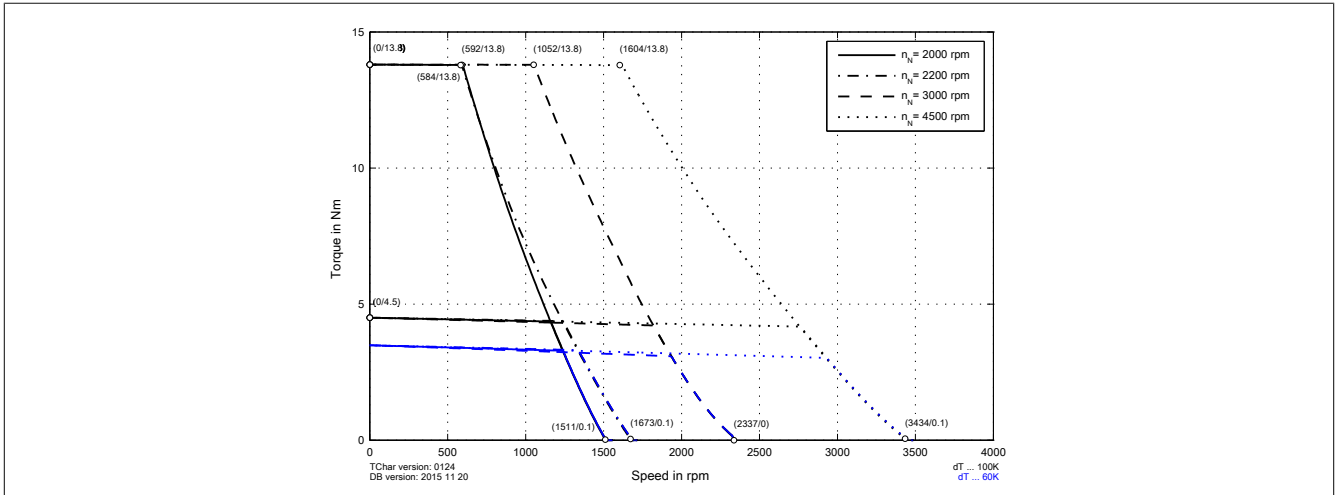
Table 59: 8LSA55.ee022ffgg-3, 8LSA55.ee030ffgg-3, 8LSA55.ee045ffgg-3, 8LSA56.ee015ffgg-3, 8LSA56.ee020ffgg-3, 8LSA56.ee022ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

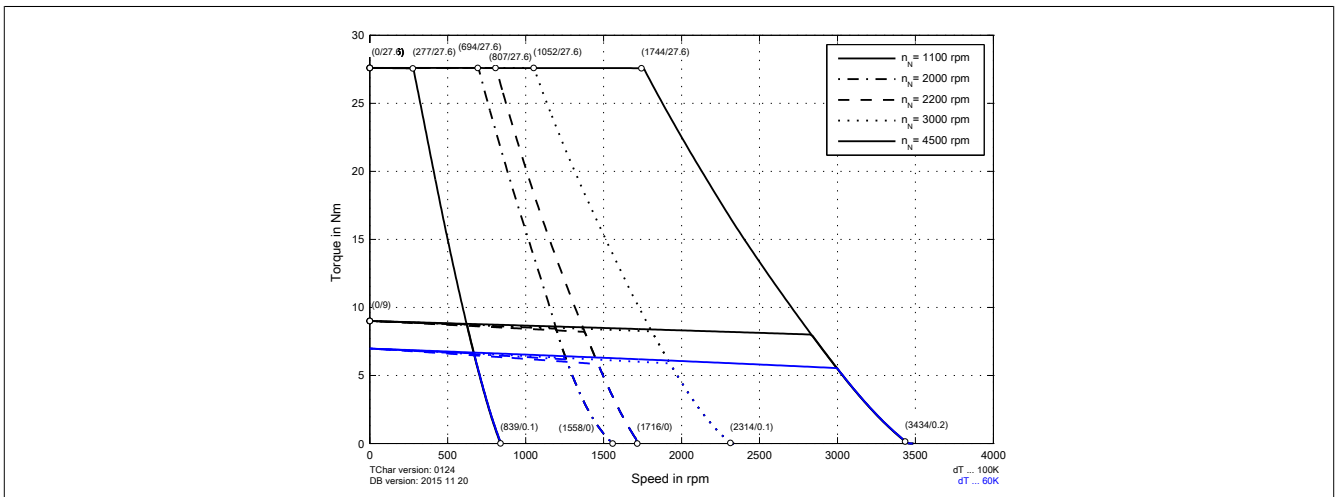
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

2.7.4.1 Speed-torque characteristics at DC bus voltage of 325 VDC

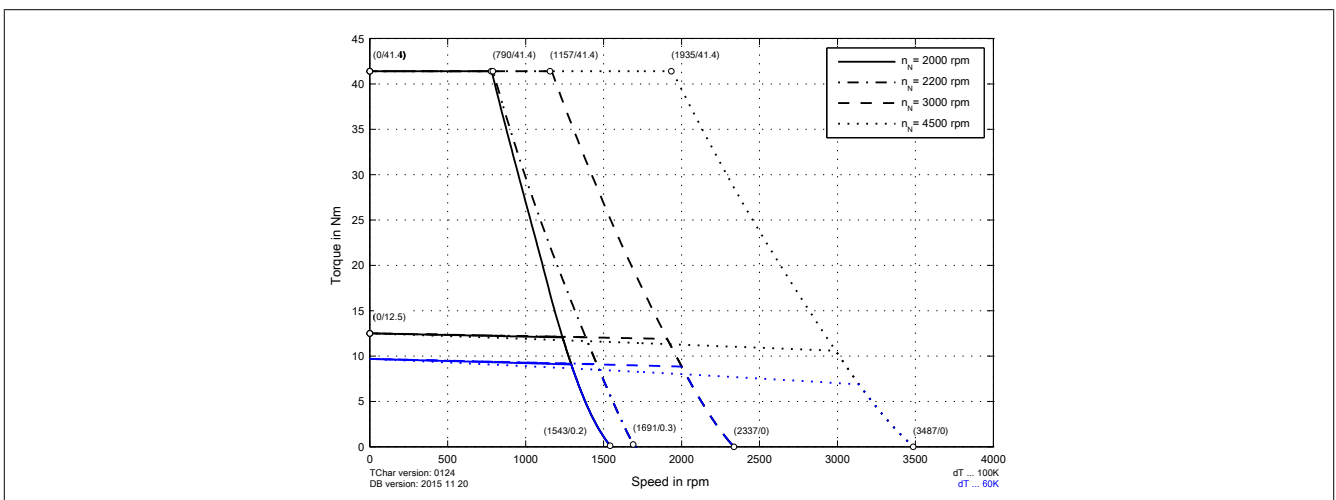
8LSA53.eennffgg-3



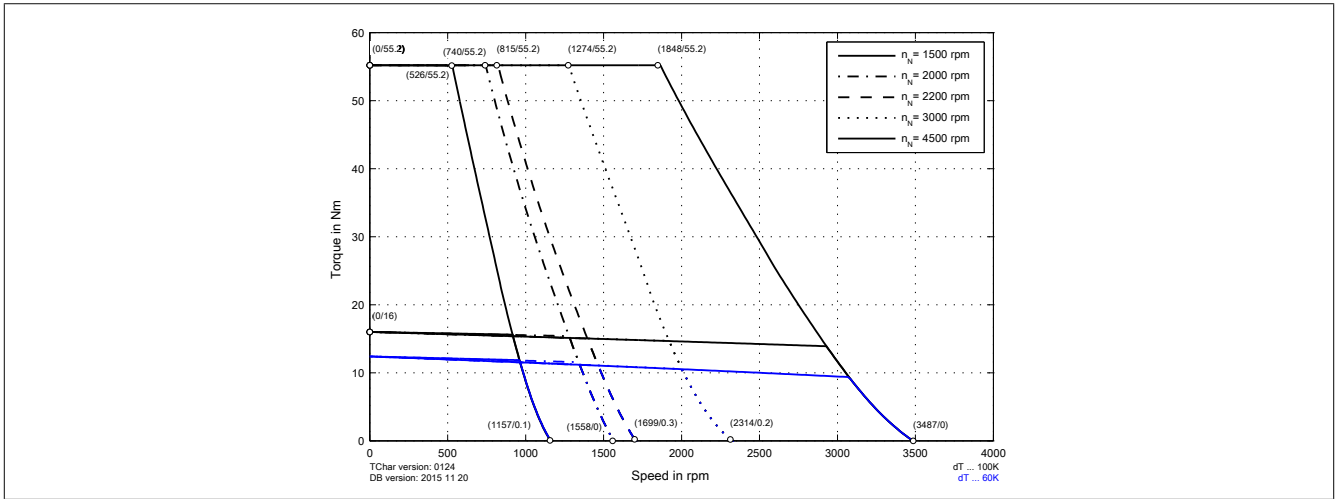
8LSA54.eennffgg-3



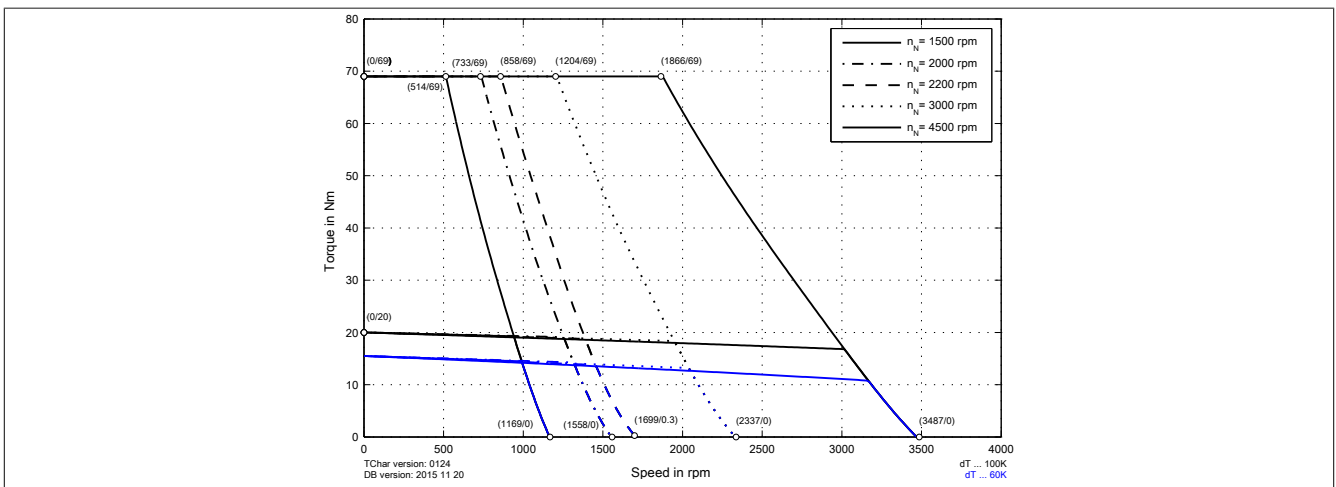
8LSA55.eennffgg-3



8LSA56.eennffgg-3



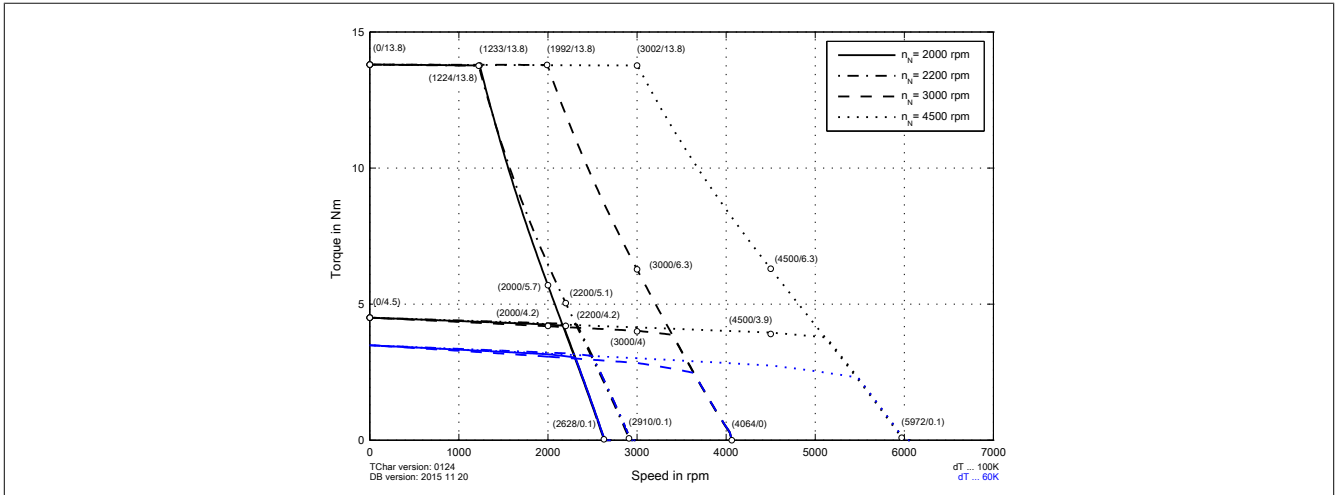
8LSA57.eennffgg-3



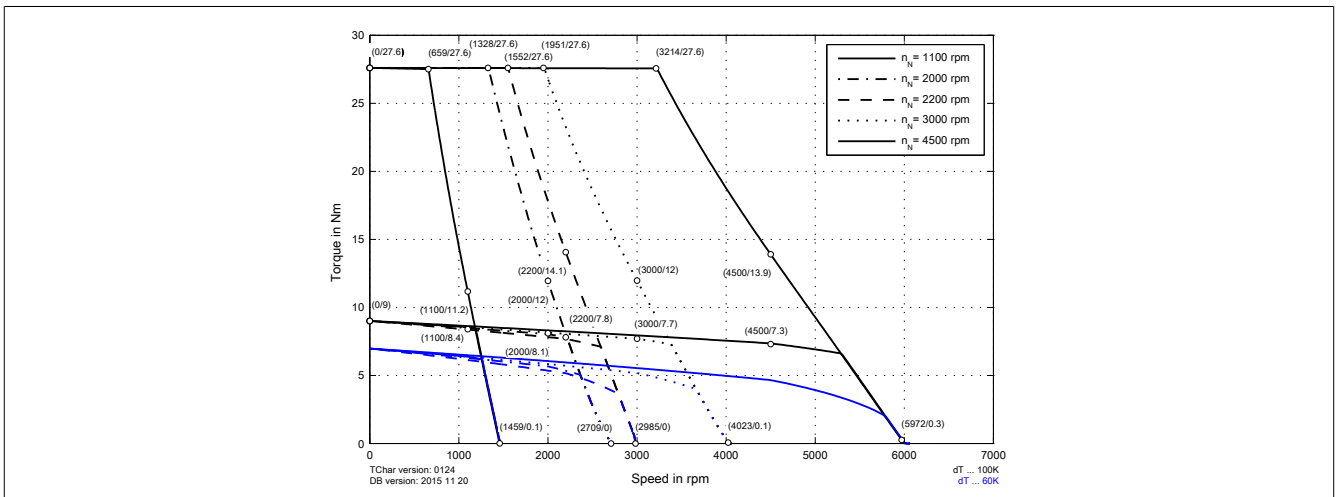


### 2.7.4.2 Speed-torque characteristics at DC bus voltage of 560 VDC

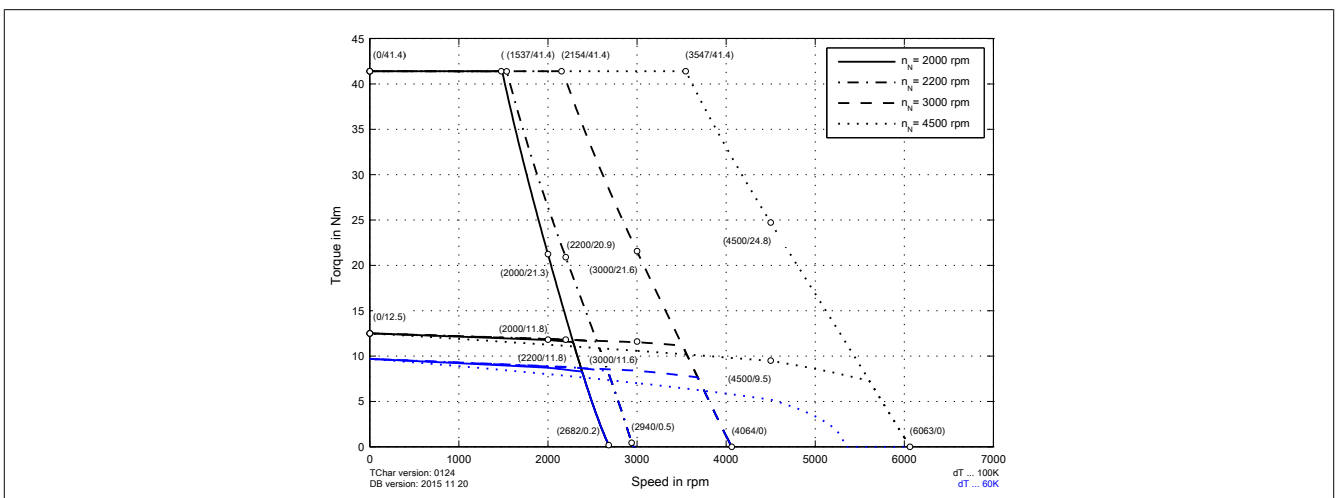
#### 8LSA53.eennffgg-3



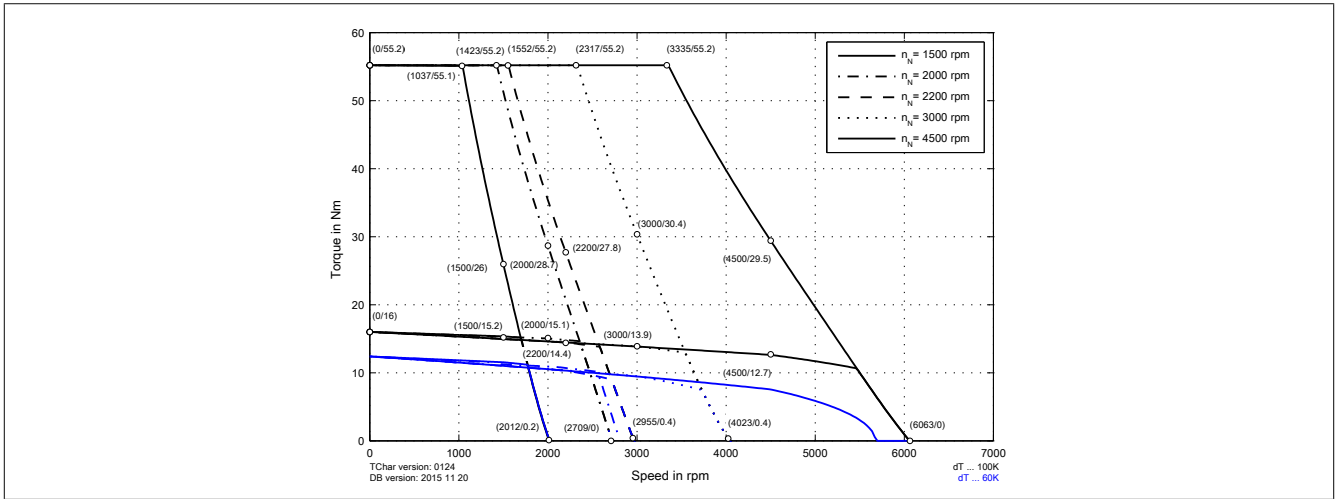
#### 8LSA54.eennffgg-3



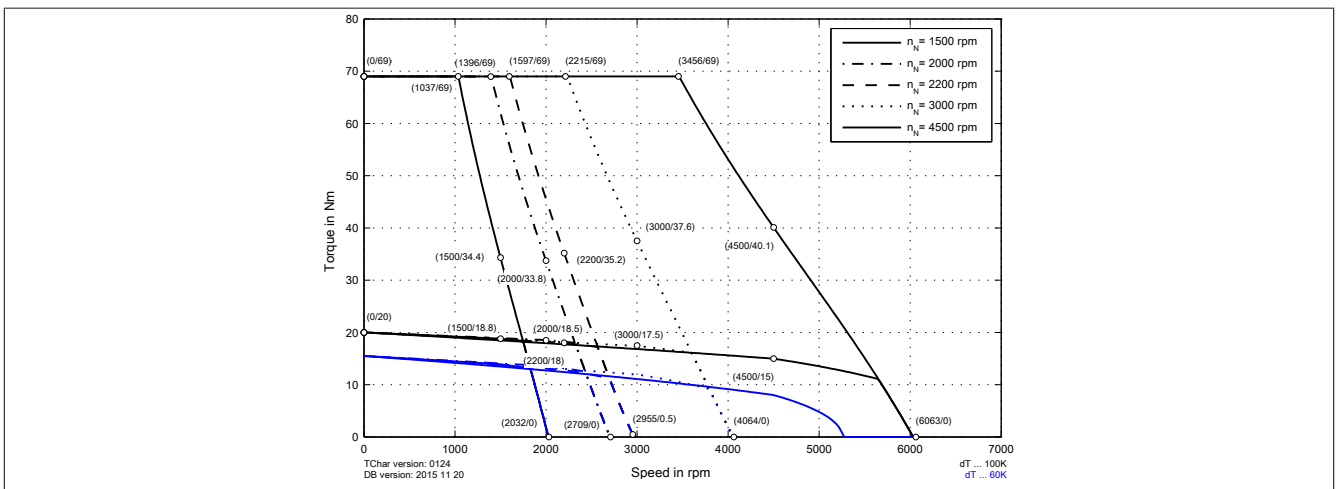
#### 8LSA55.eennffgg-3



8LSA56.eennffgg-3

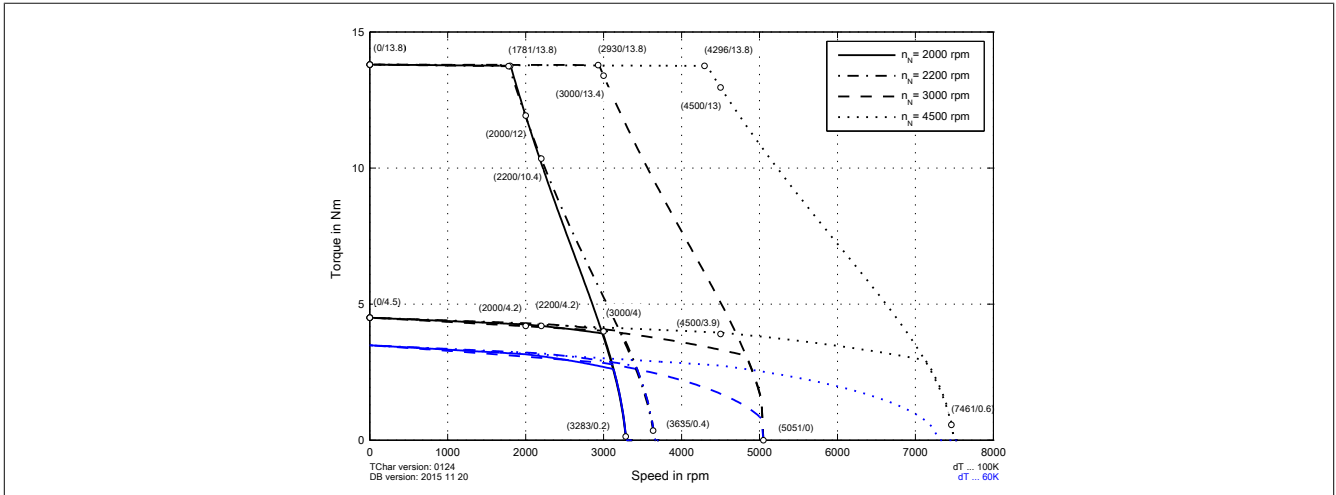


8LSA57.eennffgg-3

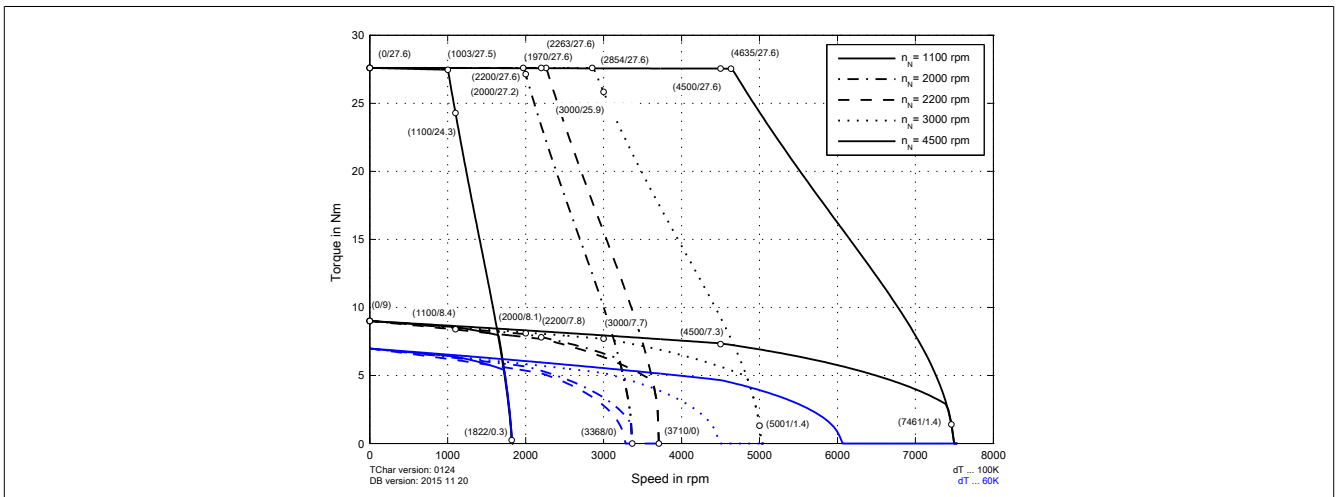


### 2.7.4.3 Speed-torque characteristics at DC bus voltage of 750 VDC

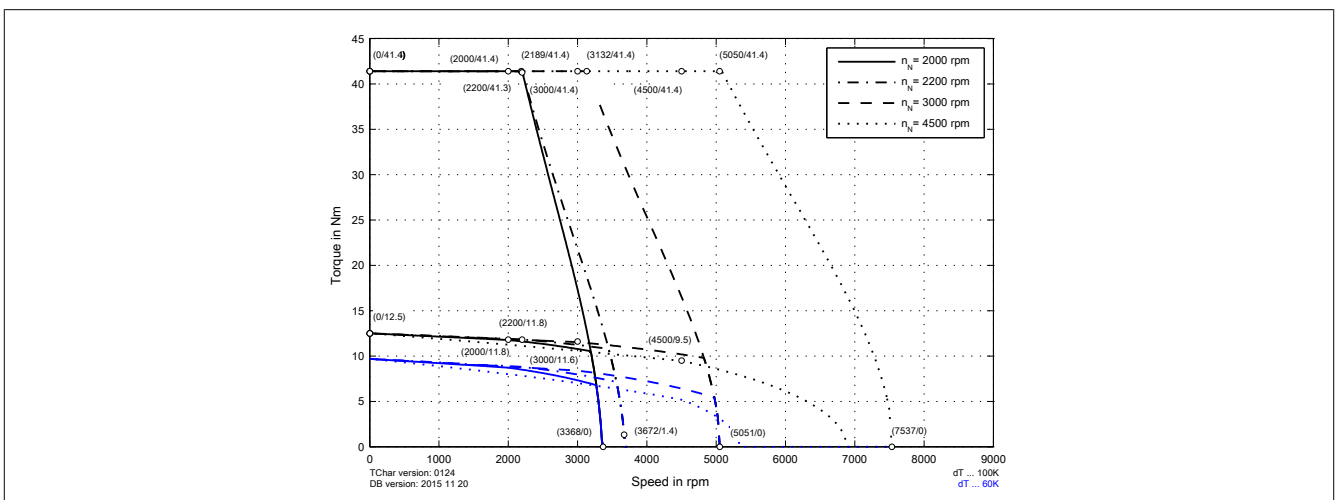
#### 8LSA53.eennffgg-3



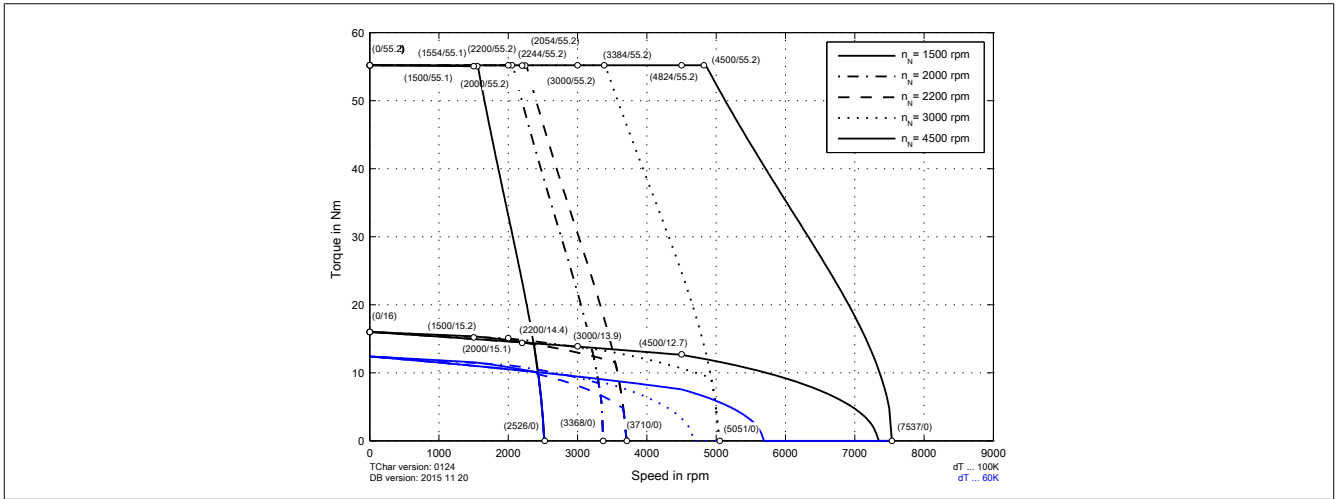
#### 8LSA54.eennffgg-3



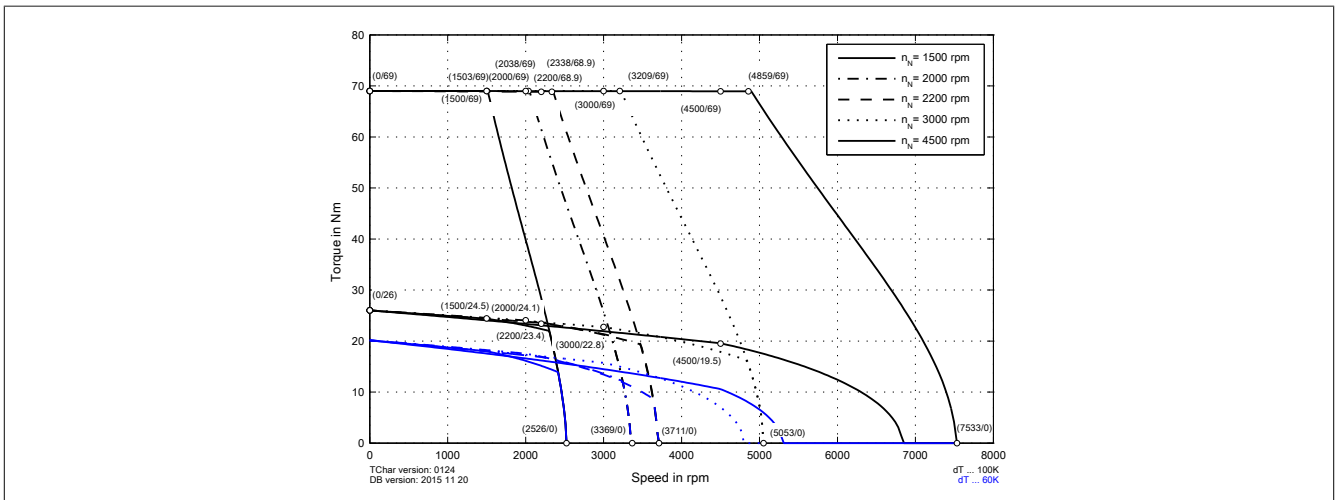
#### 8LSA55.eennffgg-3



8LSA56.eennffgg-3



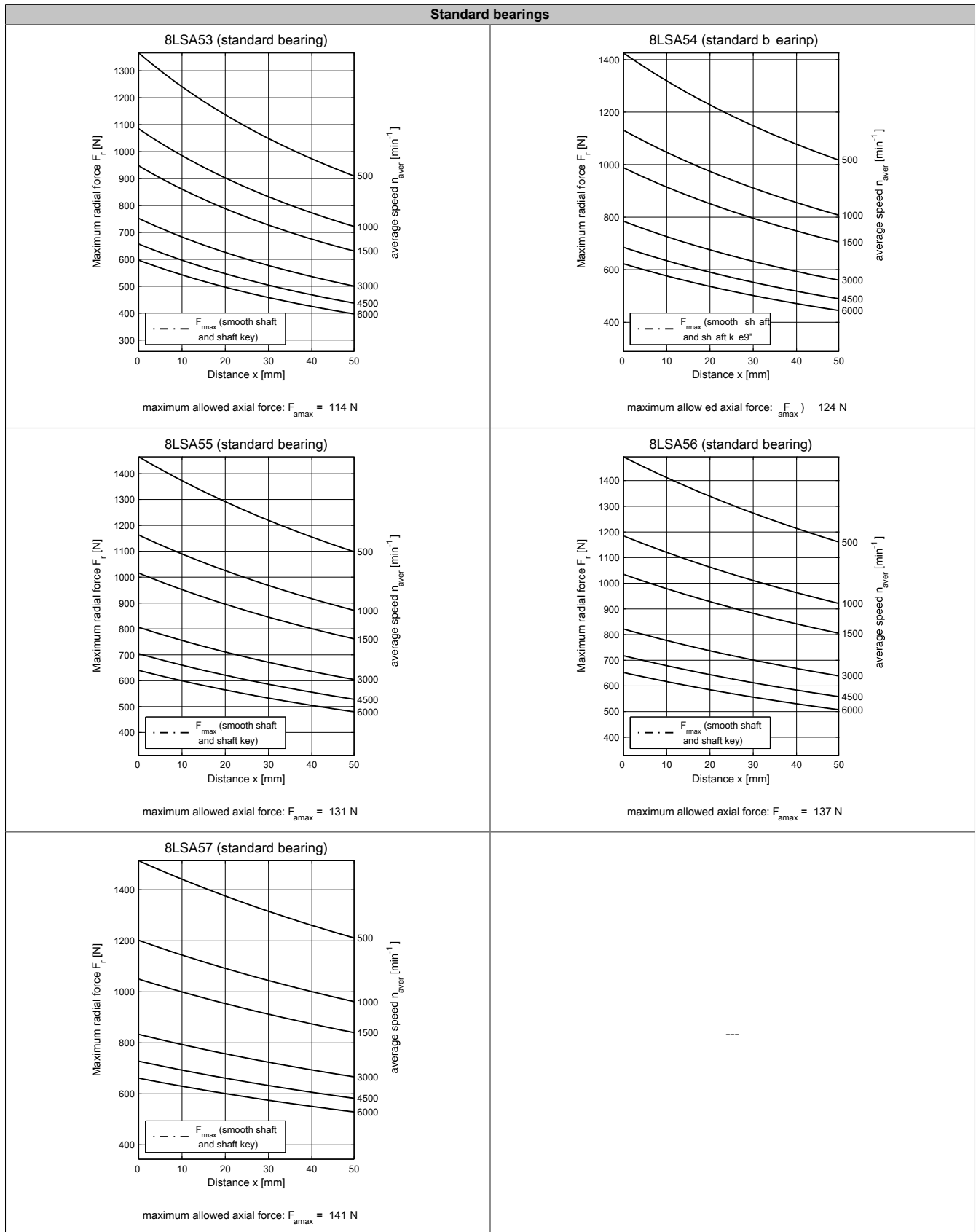
8LSA57.eennffgg-3



### 2.7.4.4 Permissible shaft load

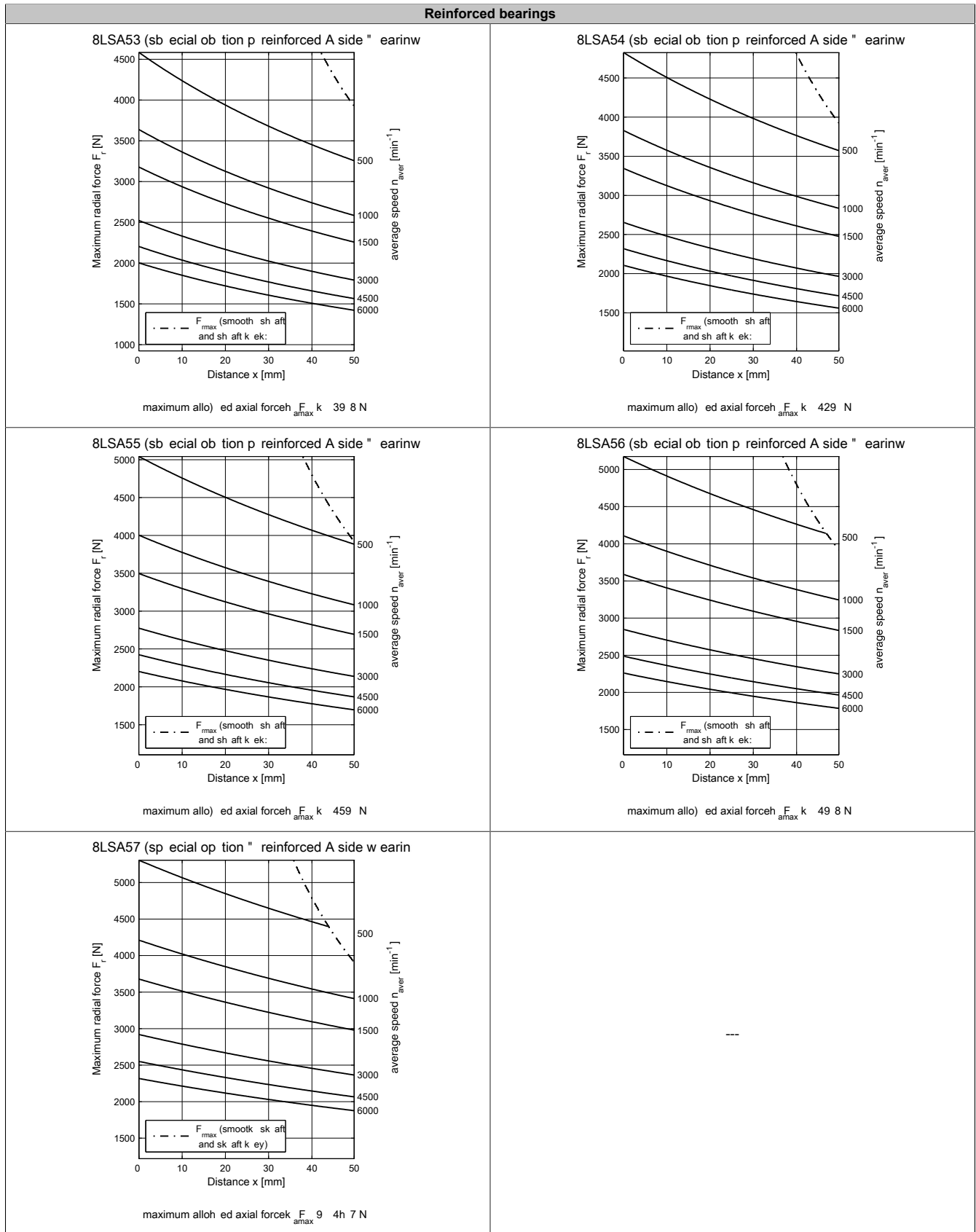
#### 2.7.4.4.1 8LSA/C5 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!

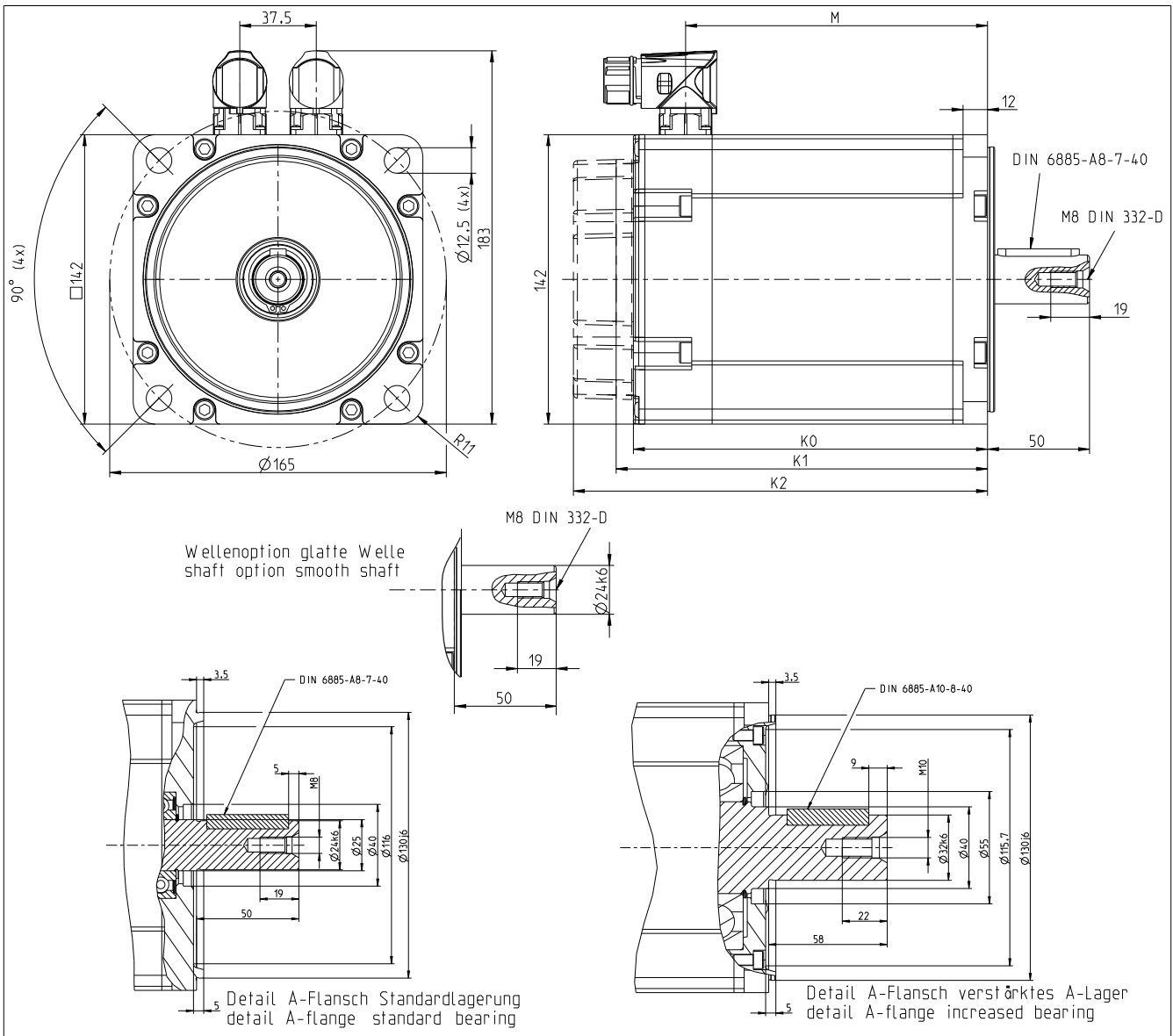


2.7.4.4.2 8LSA/C5 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!



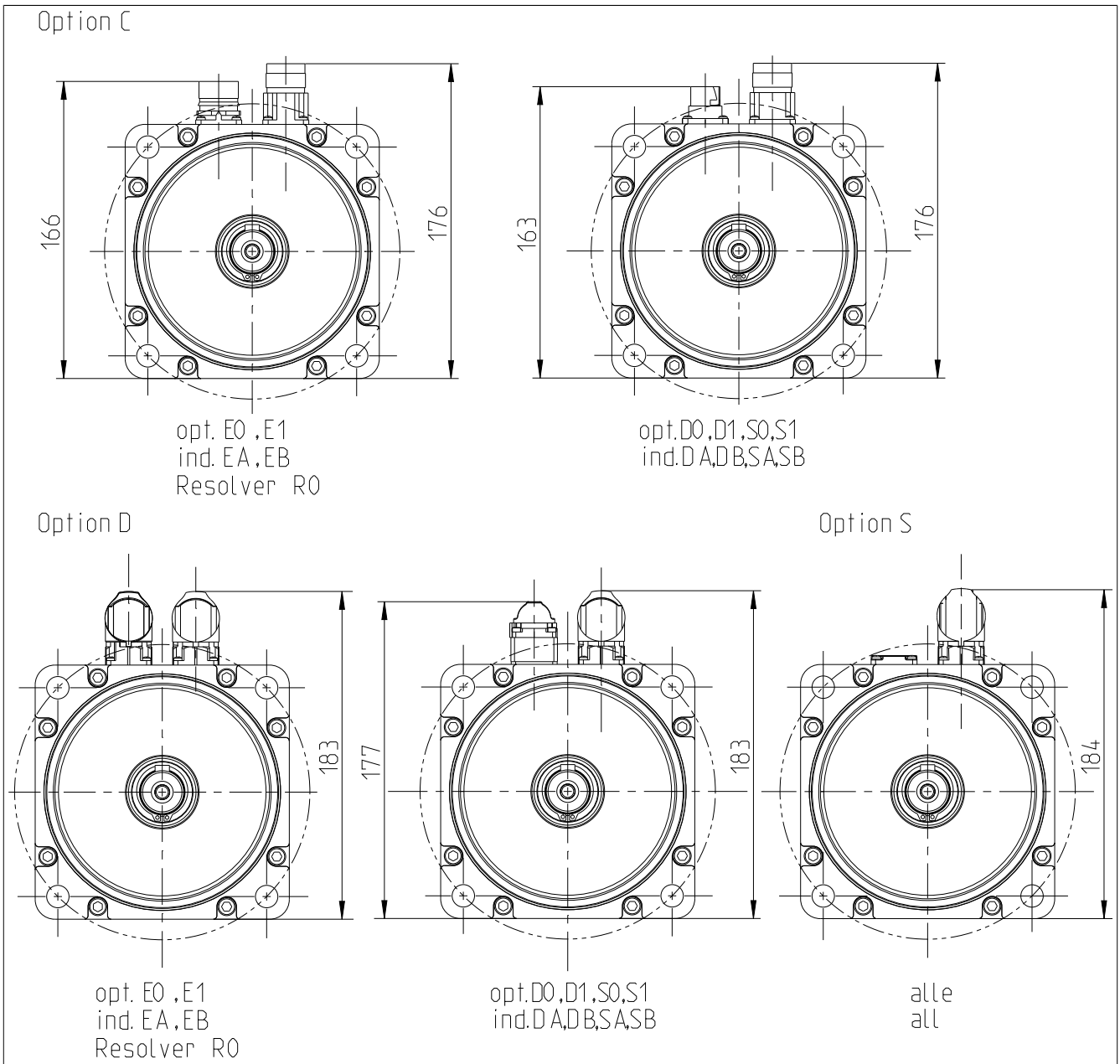
2.7.4.5 8LSA5 Version 3 - Dimensions



EnDat / resolver feedback				Extension of $K_0$ , $K_1$ , $K_2$ and $M$ depending on the motor option [mm]				
Encoder assignments	DA,D-B,SA,SB,R2	EA,EB	D0,D1,E0,E1,S0,S1					
Model number	$K_0$	$K_1$	$K_2$	$M$	Holding brake	Heavy Brake	Duty	Reinforced A side bearing
8LSA53.eennffgg-3	148	159	178	123	35	50		15
8LSA54.eennffgg-3	173	184	203	148	35	50		10
8LSA55.eennffgg-3	198	209	228	173	30	45		10
8LSA56.eennffgg-3	223	234	253	198	30	45		5
8LSA57.eennffgg-3	248	259	278	223	25	40		5

Whether or not an oil seal is used has no effect on the length of the motor.

2.7.4.5.1 8LSA5 V3 - Connector options - Dimensions





## 2.7.5 Technical data - 8LSA6 V3

Model number	8LSA63. ee015ffgg-3	8LSA63. ee022ffgg-3	8LSA63. ee030ffgg-3	8LSA63. ee045ffgg-3	8LSA64. ee015ffgg-3	8LSA64. ee022ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	1500	2200	3000	4500	1500	2200
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	12	11.8	11.6	9.5	18.5	18
Nominal power $P_N$ [W]	1885	2719	3644	4477	2906	4147
Nominal current $I_N$ [A]	3.7	5.3	7.1	8.71	5.7	8.1
Stall torque $M_0$ [Nm]	12.5				20	
Stall current $I_0$ [A]	3.8	5.6	7.7	11.5	6.1	9
Maximum torque $M_{max}$ [Nm]	46.92				78.2	
Maximum current $I_{max}$ [A]	21.2	30.5	42.5	61	33.9	49.5
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	3.26	2.22	1.63	1.09	3.26	2.22
Voltage constant $K_E$ [V/1000 rpm]	196.9	134	98.4	66	196.9	134
Stator resistance $R_{2ph}$ [ $\Omega$ ]	4.508	2.265	1.127	0.51	2.541	1.13
Stator inductance $L_{2ph}$ [mH]	50	24.29	12.5	5	31.64	13.17
Electrical time constant $t_{el}$ [ms]	11.1	10.7	11.1	9.7	12.5	11.7
Thermal time constant $t_{therm}$ [min]	42				45	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	8.19				13.13	
Mass without brake $m$ [kg]	12.8				16.7	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	32					
Brake mass [kg]	1.5	1.6				
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	5.85					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045	1090		1180	1090	1180
ACOPOS multi inverter module 8BVlxxxx...	0055		0110		0055	0110
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 60: 8LSA63.ee015ffgg-3, 8LSA63.ee022ffgg-3, 8LSA63.ee030ffgg-3, 8LSA63.ee045ffgg-3, 8LSA64.ee015ffgg-3, 8LSA64.ee022ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA64. ee030ffgg-3	8LSA64. ee045ffgg-3	8LSA65. ee015ffgg-3	8LSA65. ee022ffgg-3	8LSA65. ee030ffgg-3	8LSA65. ee045ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000	4500	1500	2200	3000	4500
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	17.5	15.1	22		21	12.2
Nominal power $P_N$ [W]	5498	7116	3456	5068	6597	5749
Nominal current $I_N$ [A]	10.7	13.8	6.8	9.9	12.9	11.2
Stall torque $M_0$ [Nm]	20		24			
Stall current $I_0$ [A]	12.3	18.3	7.4	10.8	14.7	22
Maximum torque $M_{max}$ [Nm]	78.2		97.92			
Maximum current $I_{max}$ [A]	67.8	106.5	44.6	64.31	90.9	130.49
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	1.63	1.09	3.26	2.22	1.63	1.09
Voltage constant $K_E$ [V/1000 rpm]	98.4	66	196.9	134	98.4	66
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.62	0.285	2.016	0.94	0.484	0.2
Stator inductance $L_{zph}$ [mH]	7.21	3.21	24.98	10.9	6	2.48
Electrical time constant $t_{el}$ [ms]	11.6	11.03	12.4	11.6	12.4	
Thermal time constant $t_{therm}$ [min]	45		48			
Moment of inertia $J$ [kgcm <sup>2</sup> ]	13.13		15.6			
Mass without brake $m$ [kg]	16.7		18.1			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	32					
Brake mass [kg]	1.6					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	5.85					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180	1320	1090	1180		1320
ACOPOS multi inverter module 8BVxxxx...	0110	0220	0110		0220	0330
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5	4	0.75		1.5	4
Connector type	speedtec					
Connector size	1.0					

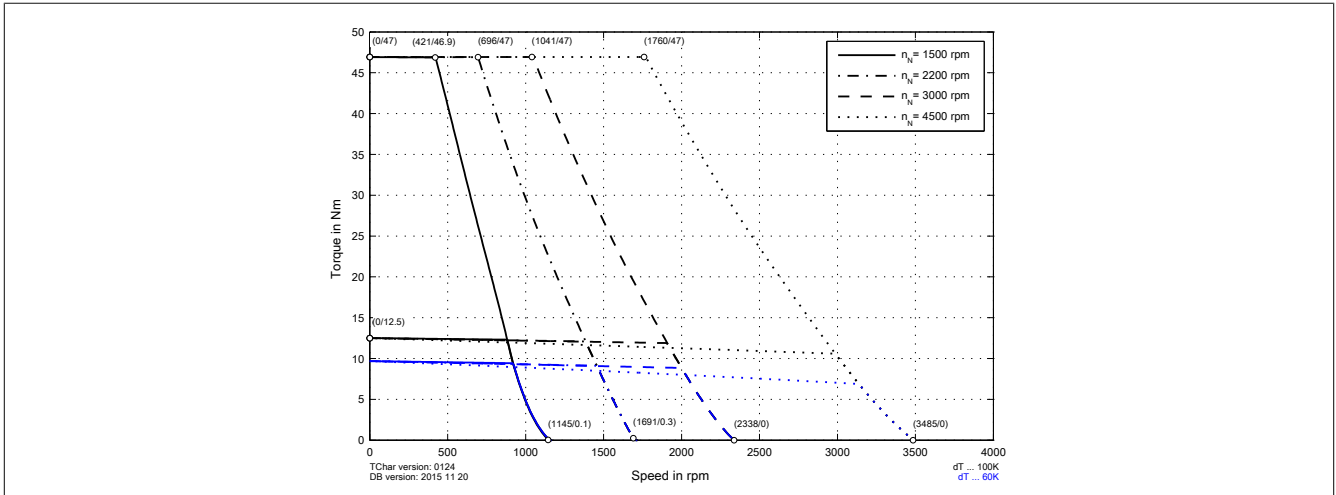
Table 61: 8LSA64.ee030ffgg-3, 8LSA64.ee045ffgg-3, 8LSA65.ee015ffgg-3, 8LSA65.ee022ffgg-3, 8LSA65.ee030ffgg-3, 8LSA65.ee045ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

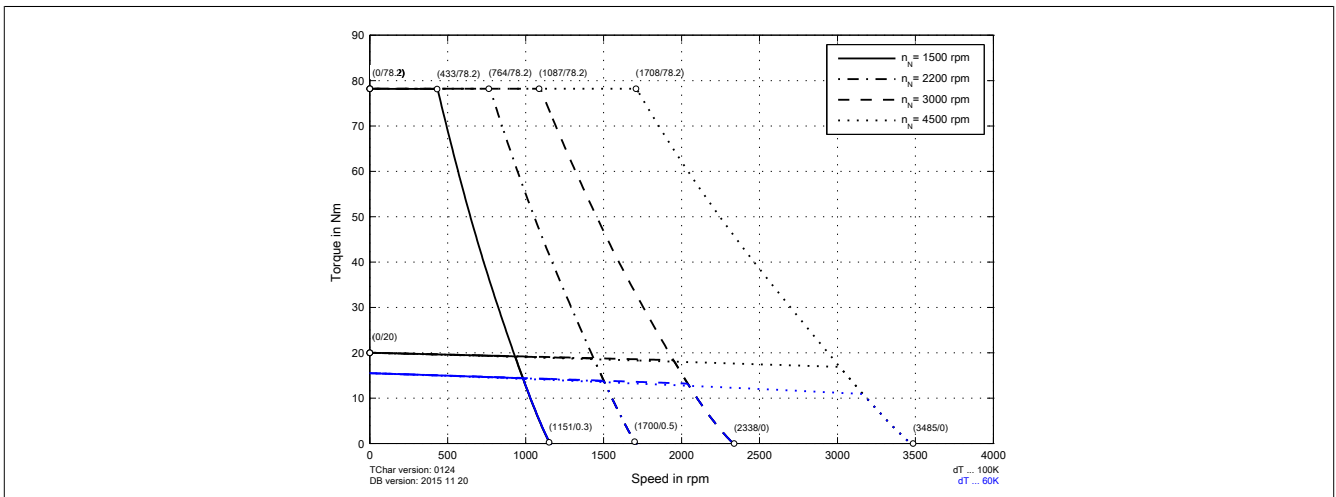
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

### 2.7.5.1 Speed-torque characteristics at DC bus voltage of 325 VDC

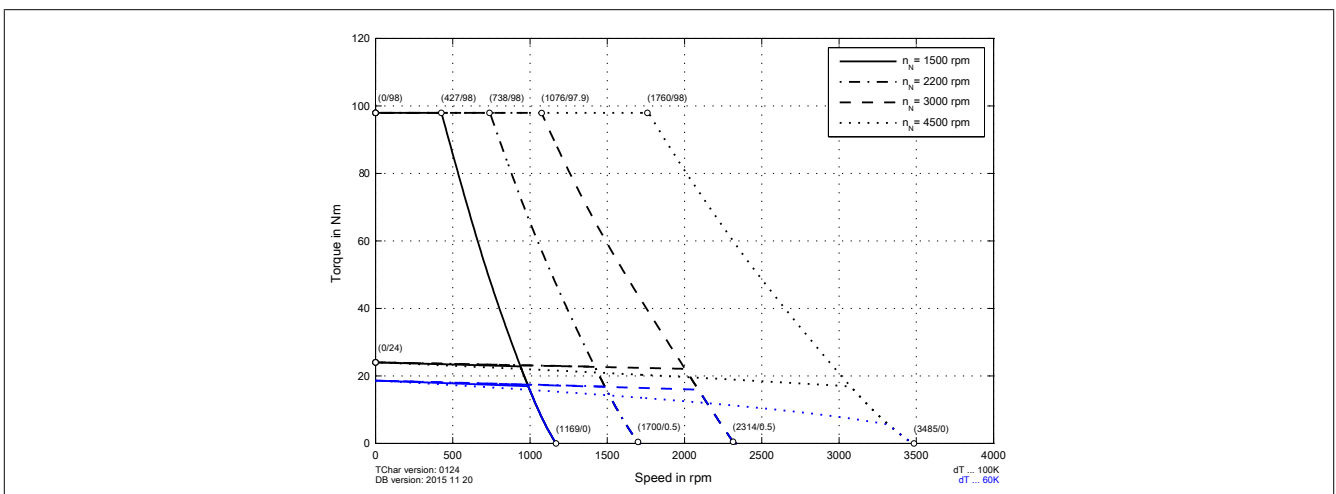
#### 8LSA63.eennffgg-3



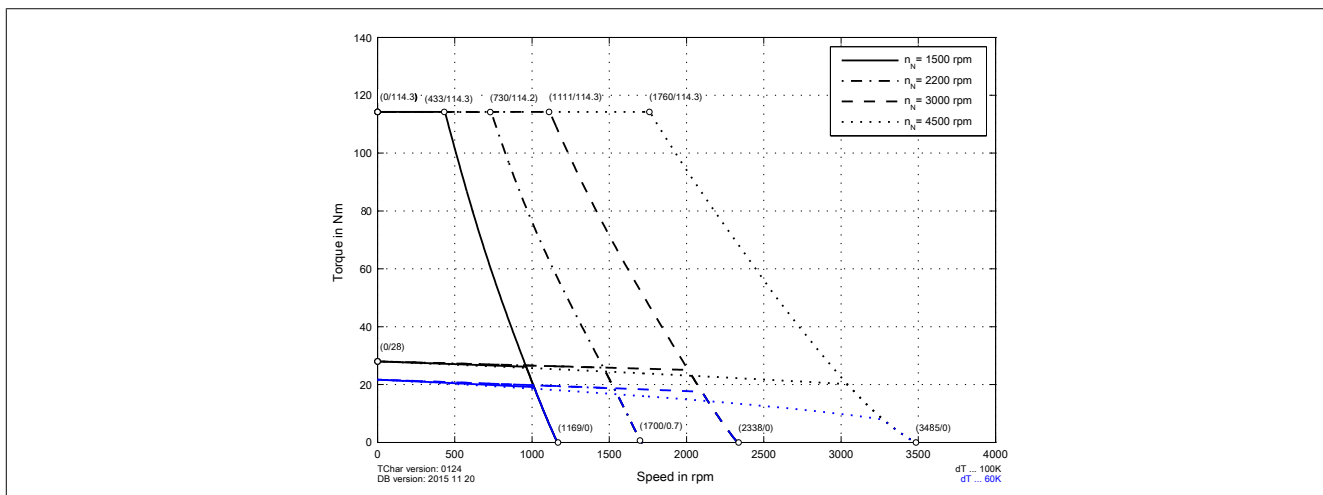
#### 8LSA64.eennffgg-3



#### 8LSA65.eennffgg-3

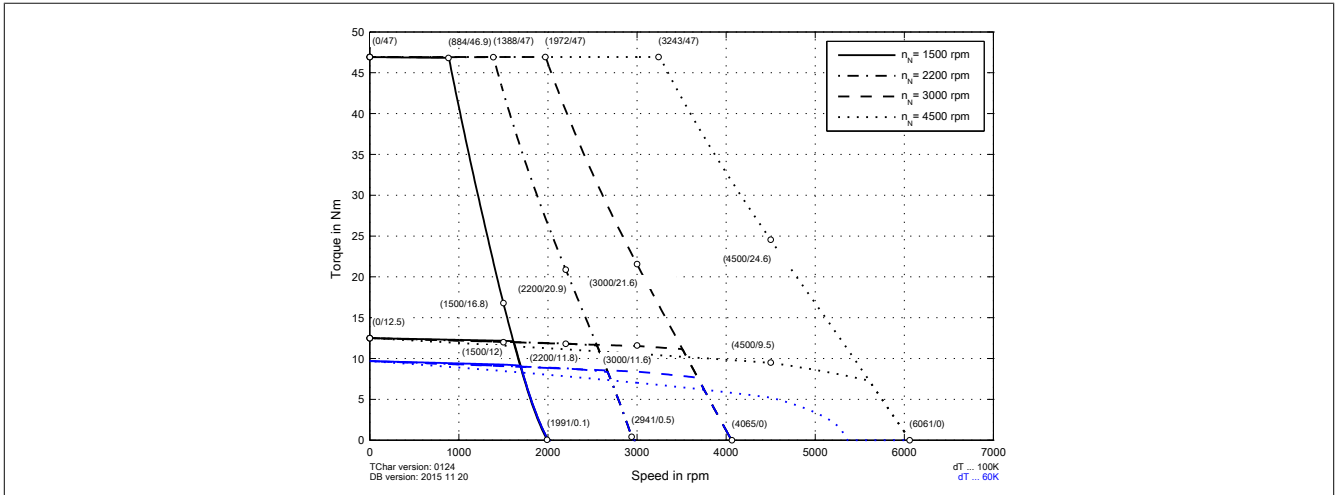


8LSA66.eennffgg-3

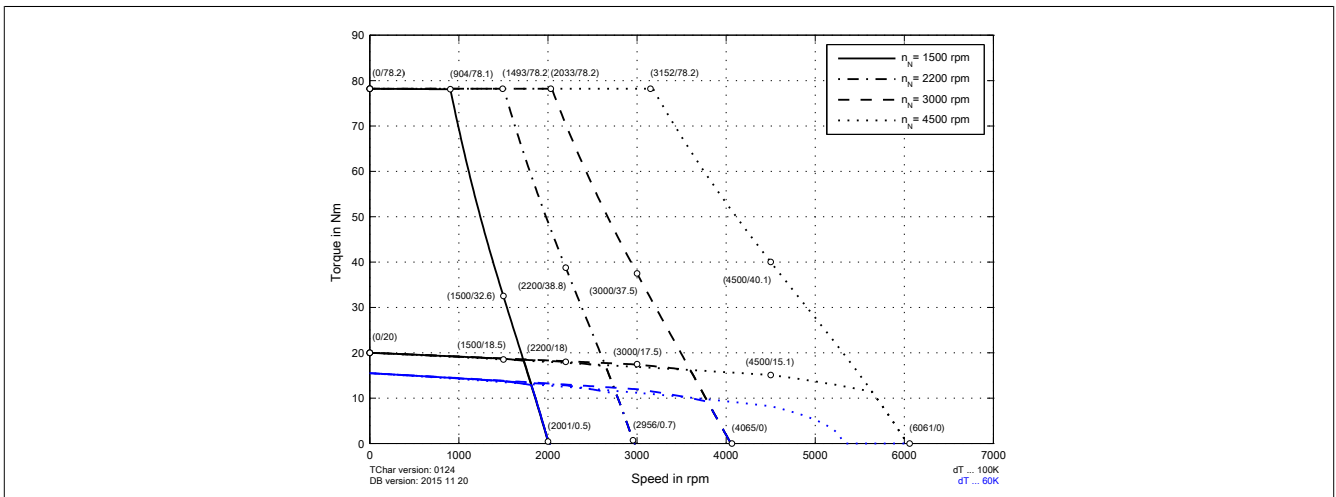


### 2.7.5.2 Speed-torque characteristics at DC bus voltage of 560 VDC

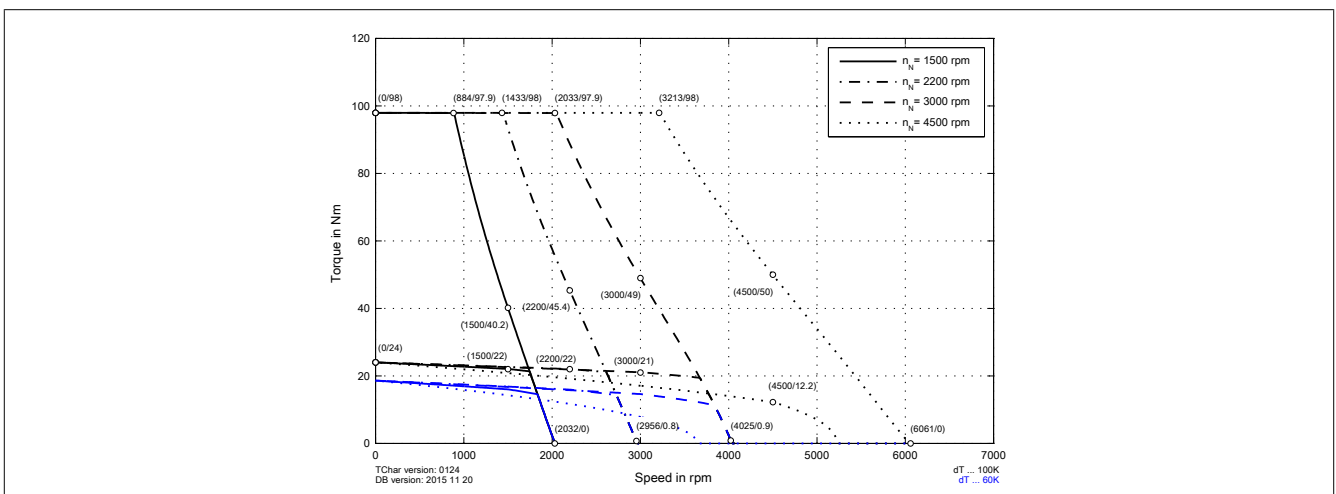
#### 8LSA63.eennffgg-3



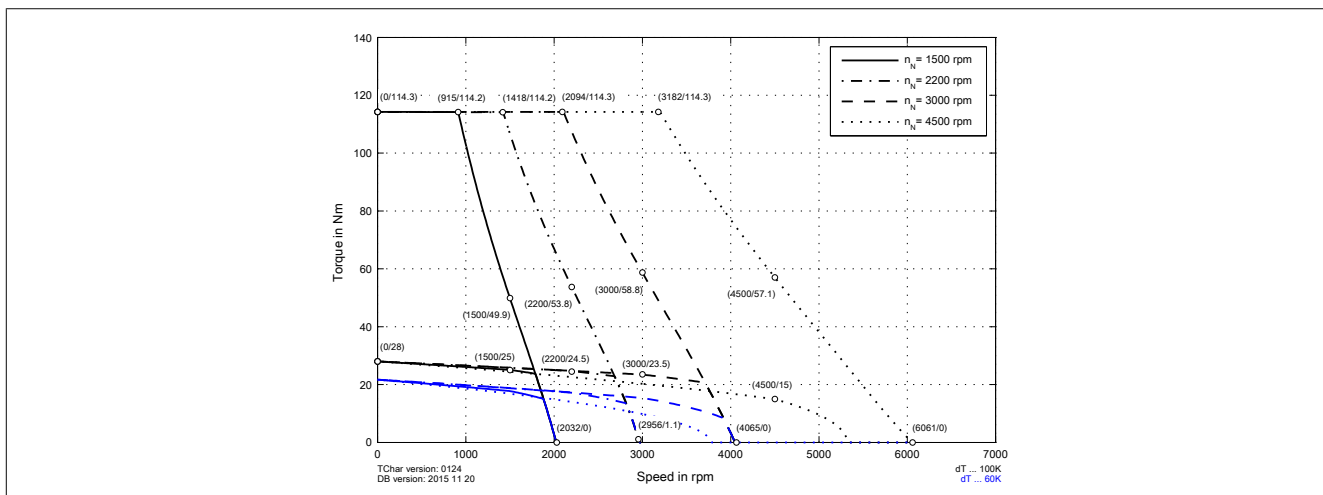
#### 8LSA64.eennffgg-3



#### 8LSA65.eennffgg-3

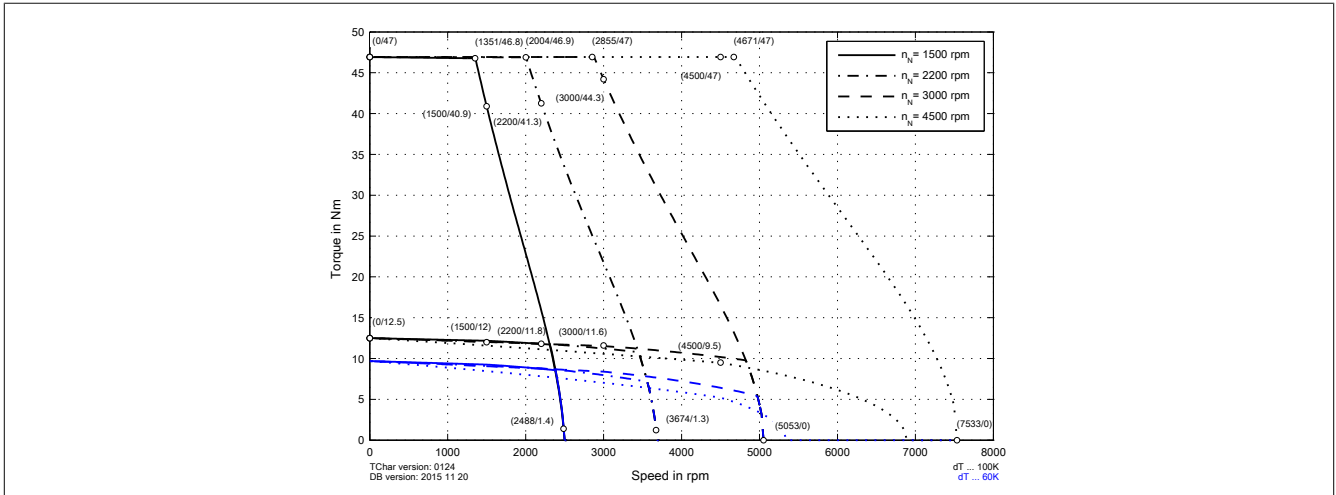


8LSA66.eennffgg-3

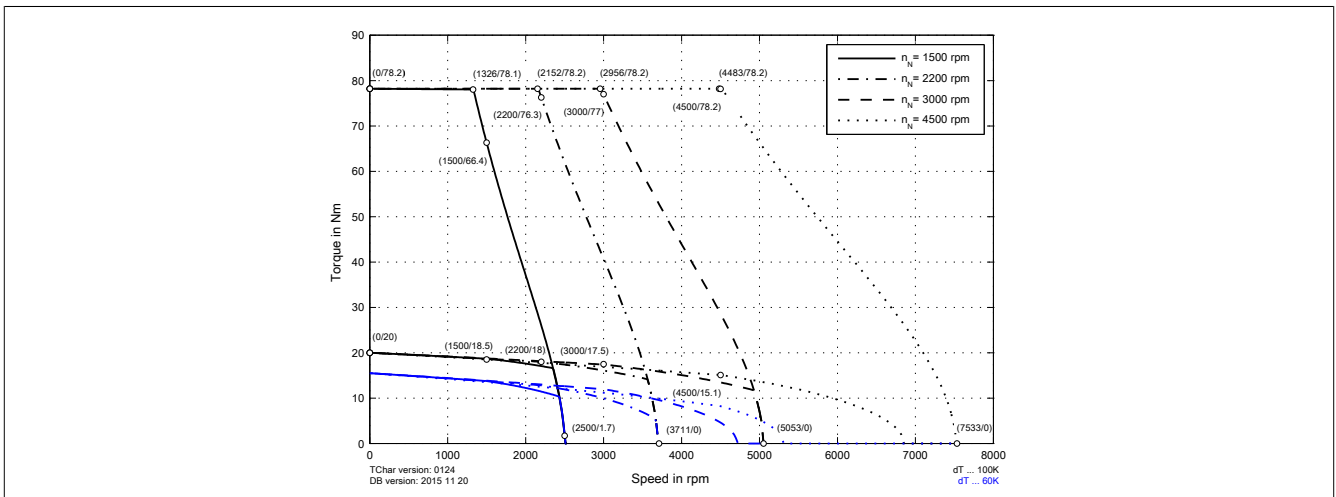


### 2.7.5.3 Speed-torque characteristics at DC bus voltage of 750 VDC

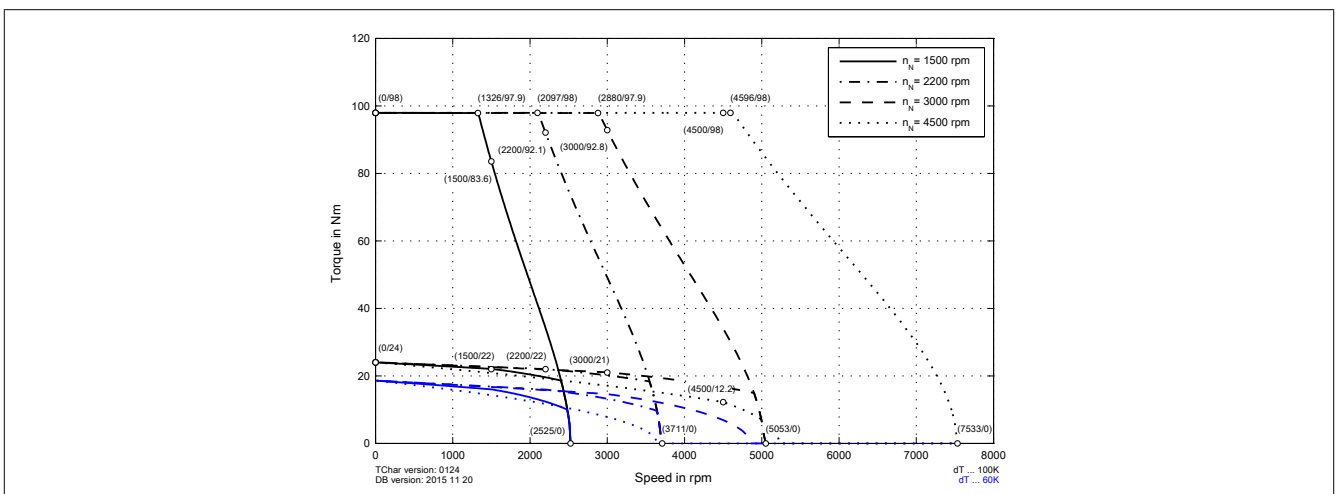
#### 8LSA63.eennffgg-3



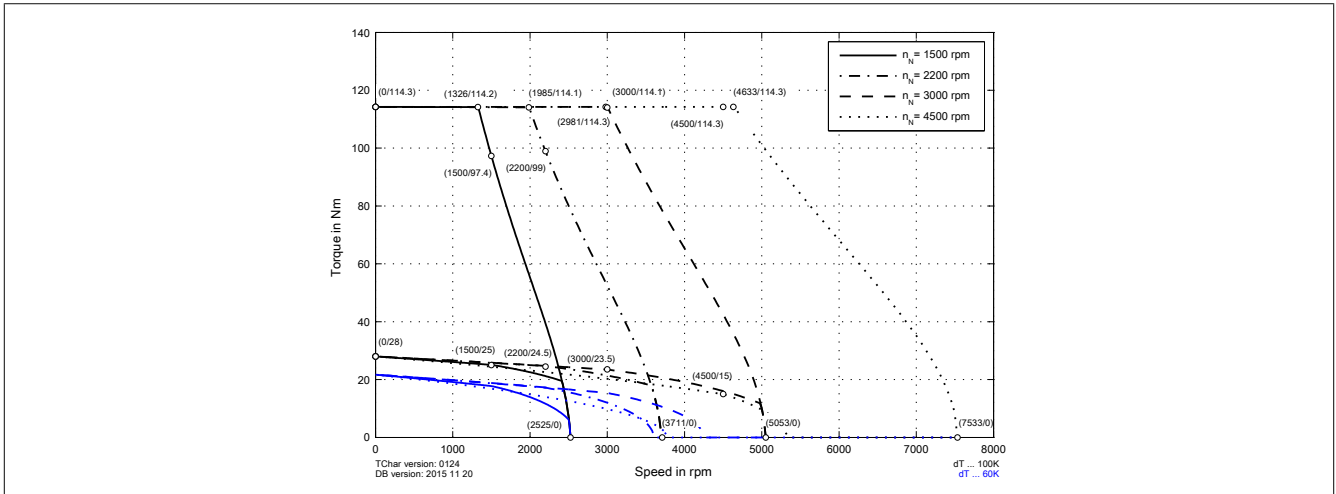
#### 8LSA64.eennffgg-3



#### 8LSA65.eennffgg-3



8LSA66.eennffgg-3

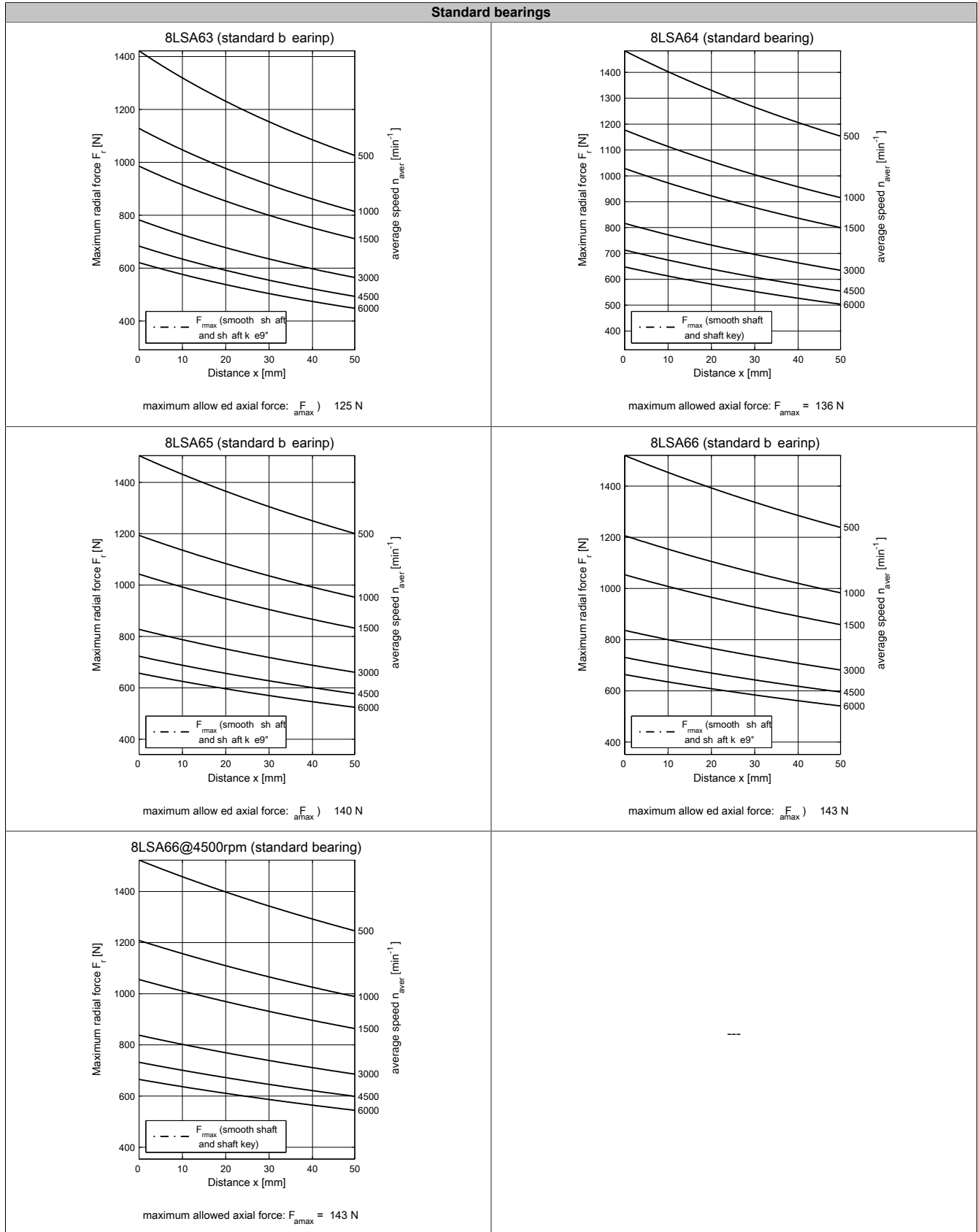




### 2.7.5.4 Permissible shaft load

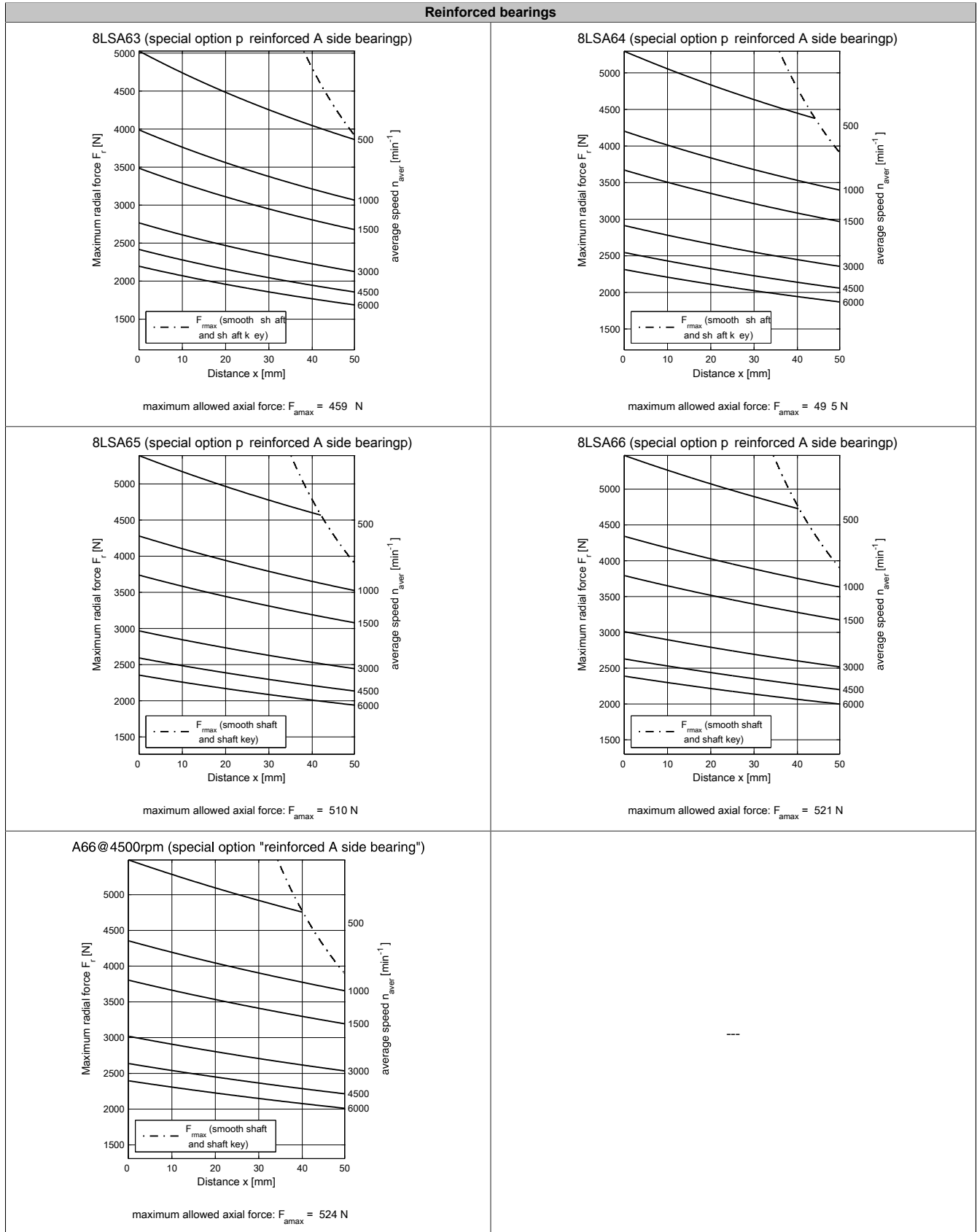
#### 2.7.5.4.1 8LSA/C6 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!



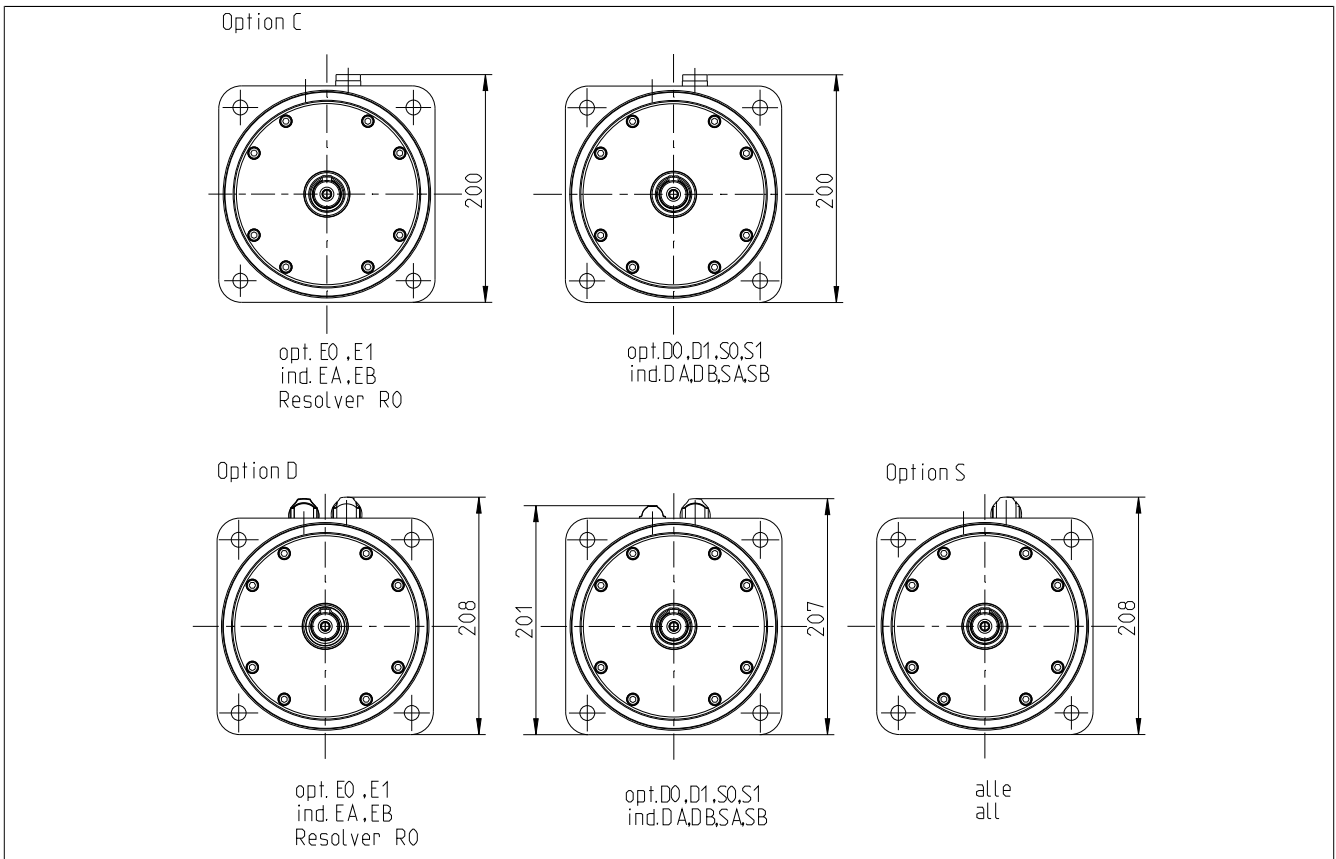
2.7.5.4.2 8LSA/C6 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!

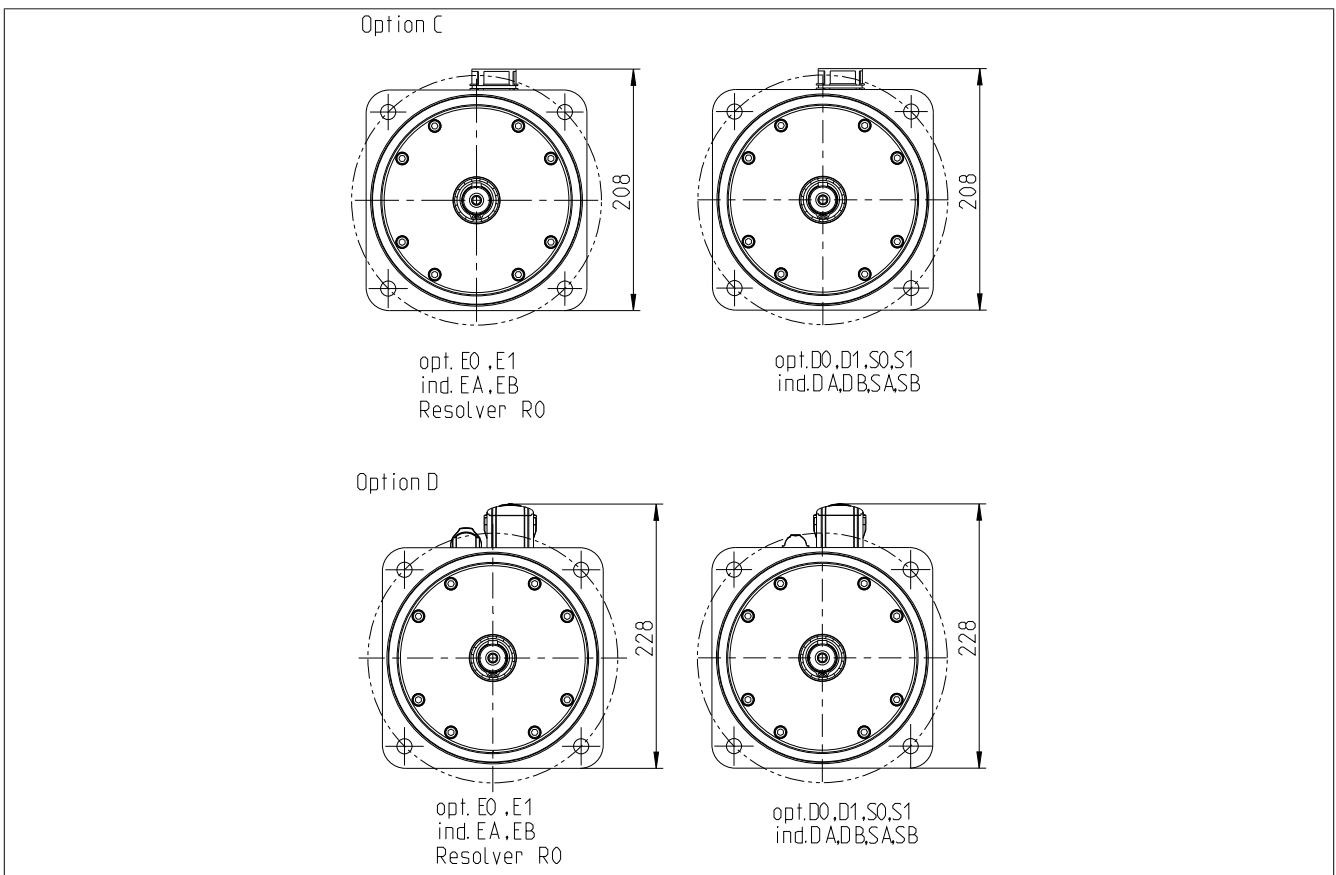




**2.7.5.5.1 8LSA6 V3 - Connector options - Dimensions**



**2.7.5.5.2 8LSA6 V3 - Connector options - Size 1.5 - Dimensions**



## 2.7.6 Technical data - 8LSA7 V3

Model number	8LSA73. ee020ffgg-3	8LSA73. ee022ffgg-3	8LSA73. ee030ffgg-3	8LSA73. ee045ffgg-3	8LSA74. ee022ffgg-3	8LSA74. ee015ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2000	2200	3000	-	2200	1500
Number of pole pairs	5			-	5	
Nominal torque $M_N$ [Nm]	22.2	21.9	20.5	-	27.5	29.3
Nominal power $P_N$ [W]	4650	5045	6440	-	6336	4602
Nominal current $I_N$ [A]	9.098	9.865	12.577	-	12.387	8.988
Stall torque $M_0$ [Nm]	26			-	33	
Stall current $I_0$ [A]	10.656	11.712	15.951	-	14.865	10.123
Maximum torque $M_{max}$ [Nm]	107			-	150	
Maximum current $I_{max}$ [A]	64.5	71	96.54	-	99	68
Maximum speed $n_{max}$ [rpm]	6000			-	6000	
Torque constant $K_T$ [Nm/A]	2.44	2.22	1.63	-	2.22	3.26
Voltage constant $K_E$ [V/1000 rpm]	147.65	134.04	98.44	-	134.04	196.87
Stator resistance $R_{2ph}$ [ $\Omega$ ]	0.93	0.72	0.42	-	0.54	1.16
Stator inductance $L_{2ph}$ [mH]	14.6	12.3	6.5	-	9	19.5
Electrical time constant $t_{el}$ [ms]	15.699	17.08	15.476	-	16.667	16.81
Thermal time constant $t_{therm}$ [min]	37			-	41	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	46			-	60	
Mass without brake $m$ [kg]	20			-	24	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	47			-	47	
Brake mass [kg]	3.8			-	3.8	
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	32			-	32	
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180			-	1180	
ACOPOS multi inverter module 8BVxxxx...	0110		0220	-	0220	0110
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75	1.5		-	1.5	0.75
Connector type	speedtec			-	speedtec	
Connector size	1.0			-	1.0	

Table 62: 8LSA73.ee020ffgg-3, 8LSA73.ee022ffgg-3, 8LSA73.ee030ffgg-3, 8LSA73.ee045ffgg-3, 8LSA74.ee022ffgg-3, 8LSA74.ee015ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA74. ee020ffgg-3	8LSA74. ee022ffgg-3	8LSA74. ee030ffgg-3	8LSA74. ee045ffgg-3	8LSA75. ee011ffgg-3	8LSA75. ee015ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2000	2200	3000	4500	1100	1500
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	28	27.5	25	18	38.5	37
Nominal power $P_N$ [W]	5864	6336	7854	8482	4435	5812
Nominal current $I_N$ [A]	11.475	12.387	15.337	16.514	8.691	11.35
Stall torque $M_0$ [Nm]	33				43	
Stall current $I_0$ [A]	13.525	14.865	20.245	30	9.707	13.19
Maximum torque $M_{max}$ [Nm]	150				187	
Maximum current $I_{max}$ [A]	90.4	99	135.33	202	62	84
Maximum speed $n_{max}$ [rpm]	6000				4500	
Torque constant $K_T$ [Nm/A]	2.44	2.22	1.63	1.09	4.43	3.26
Voltage constant $K_E$ [V/1000 rpm]	147.65	134.04	98.44	65.97	268.08	196.87
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.63	0.54	0.28	0.13	1.62	0.84
Stator inductance $L_{zph}$ [mH]	10.9	9	4.9	2.2	28.3	15.6
Electrical time constant $t_{el}$ [ms]	17.302	16.667	17.5	16.923	16	17.7
Thermal time constant $t_{therm}$ [min]	41				46	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	60				74	
Mass without brake $m$ [kg]	24				28	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	47					
Brake mass [kg]	3.8					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	32					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180		1320		1180	
ACOPOS multi inverter module 8BVxxxx...	0110	0220	0330		0110	
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5		4		0.75	1.5
Connector type	speedtec					
Connector size	1.0			1.5	1.0	

Table 63: 8LSA74.ee020ffgg-3, 8LSA74.ee022ffgg-3, 8LSA74.ee030ffgg-3, 8LSA74.ee045ffgg-3, 8LSA75.ee011ffgg-3, 8LSA75.ee015ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA75. ee015ffgg-3	8LSA75. ee020ffgg-3	8LSA75. ee022ffgg-3	8LSA75. ee030ffgg-3	8LSA76. ee015ffgg-3	8LSA76. ee022ffgg-3	
<b>Motor</b>							
Nominal speed $n_N$ [rpm]	1500	2000	2200	3000	1500	2200	
Number of pole pairs	5						
Nominal torque $M_N$ [Nm]	37	34.8	34	30	48.5	42.5	
Nominal power $P_N$ [W]	5812	7288	7833	9425	7618	9791	
Nominal current $I_N$ [A]	11.35	14.262	15.315	18.405	14.88	19.2	
Stall torque $M_0$ [Nm]	43				60		
Stall current $I_0$ [A]	13.19	17.623	19.369	26.38	18.4	27	
Maximum torque $M_{max}$ [Nm]	187				230		
Maximum current $I_{max}$ [A]	84	113	124	168.71	92.5	136	
Maximum speed $n_{max}$ [rpm]	4500						
Torque constant $K_T$ [Nm/A]	3.26	2.44	2.22	1.63	3.26	2.22	
Voltage constant $K_E$ [V/1000 rpm]	196.87	147.65	134.04	98.44	196.87	134.04	
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.84	0.49	0.39	0.21	0.57	0.26	
Stator inductance $L_{zph}$ [mH]	15.6	8.8	7.1	3.9	11.5	5.1	
Electrical time constant $t_{el}$ [ms]	17.7	17.959	17.5	18.571	17.85	19.6	
Thermal time constant $t_{therm}$ [min]	46				56		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	74				102		
Mass without brake $m$ [kg]	28				36		
<b>Holding brake</b>							
Holding torque of the brake $M_{Br}$ [Nm]	47						
Brake mass [kg]	3.8						
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	32						
<b>Recommendations</b>							
ACOPOS servo drive 8Vxxxx.xx...	1180	1320					
ACOPOS multi inverter module 8BVxxxx...	0110	0220	0330	0220	0330		
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5		4				
Connector type	speedtec						
Connector size	1.0				1.5		

Table 64: 8LSA75.ee015ffgg-3, 8LSA75.ee020ffgg-3, 8LSA75.ee022ffgg-3, 8LSA75.ee030ffgg-3, 8LSA76.ee015ffgg-3, 8LSA76.ee022ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSA76.ee030ffgg-3	8LSA77.ee030ffgg-3	8LSA78.ee030ffgg-3
<b>Motor</b>			
Nominal speed $n_N$ [rpm]		3000	
Number of pole pairs		5	
Nominal torque $M_N$ [Nm]	35	40	44
Nominal power $P_N$ [W]	10996	12566	13823
Nominal current $I_N$ [A]	21.47	24.5	27
Stall torque $M_0$ [Nm]	60	73	85
Stall current $I_0$ [A]	36.8	44.8	52.1
Maximum torque $M_{max}$ [Nm]	230	270	330
Maximum current $I_{max}$ [A]	185	212	260
Maximum speed $n_{max}$ [rpm]		4500	
Torque constant $K_T$ [Nm/A]		1.63	
Voltage constant $K_E$ [V/1000 rpm]	98.43		98.4
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.15	0.109	0.08
Stator inductance $L_{zph}$ [mH]	2.7	2.2	1.8
Electrical time constant $t_{el}$ [ms]	18	18.2	22.5
Thermal time constant $t_{therm}$ [min]	56	65	74
Moment of inertia $J$ [kgcm <sup>2</sup> ]	102	130	158
Mass without brake $m$ [kg]	36	44	52
<b>Holding brake</b>			
Holding torque of the brake $M_{Br}$ [Nm]		47	
Brake mass [kg]		3.8	
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]		32	
<b>Recommendations</b>			
ACOPOS servo drive 8Vxxxx.xx...		1640	
ACOPOS multi inverter module 8BVIxxxx...	0440		0660
Cross section for B&R motor cables [mm <sup>2</sup> ]		10	
Connector type		speedtec	
Connector size		1.5	

Table 65: 8LSA76.ee030ffgg-3, 8LSA77.ee030ffgg-3, 8LSA78.ee030ffgg-3 - Technical data

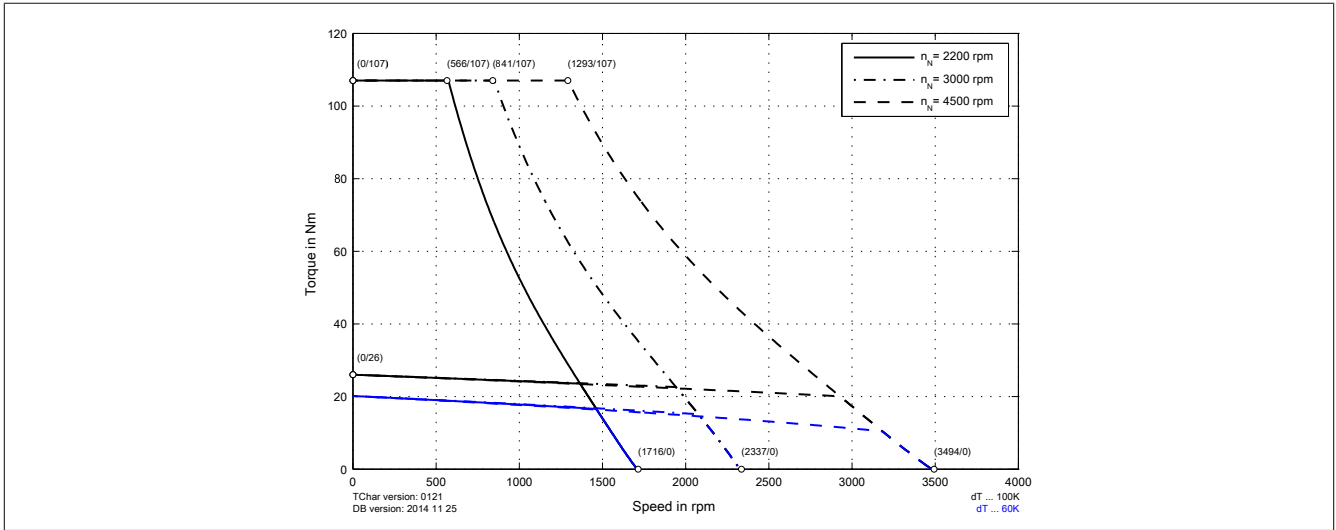
**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

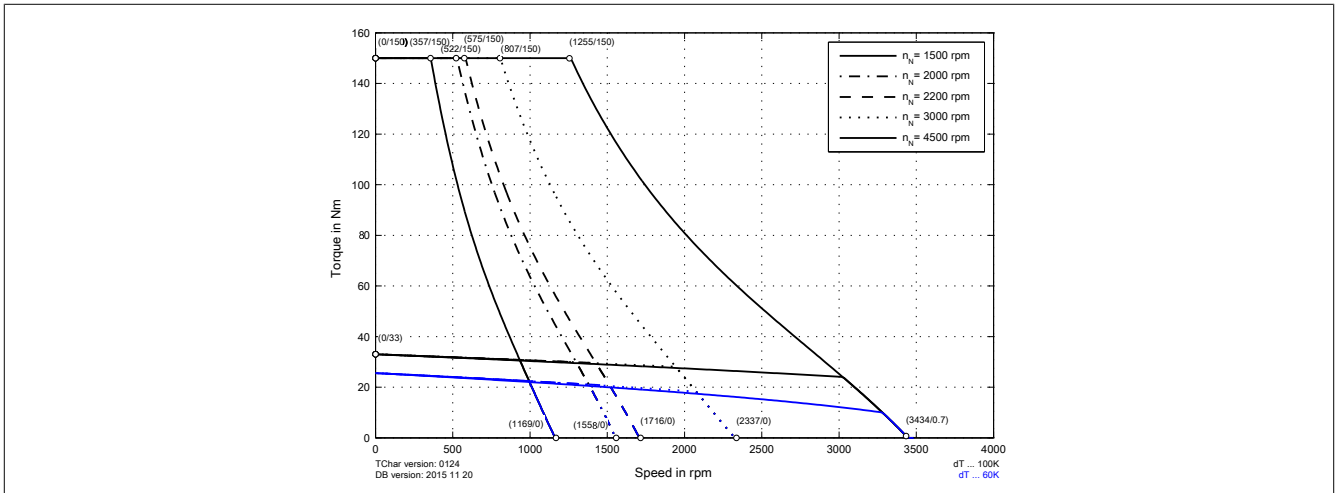


2.7.6.1 Speed-torque characteristics at DC bus voltage of 325 VDC

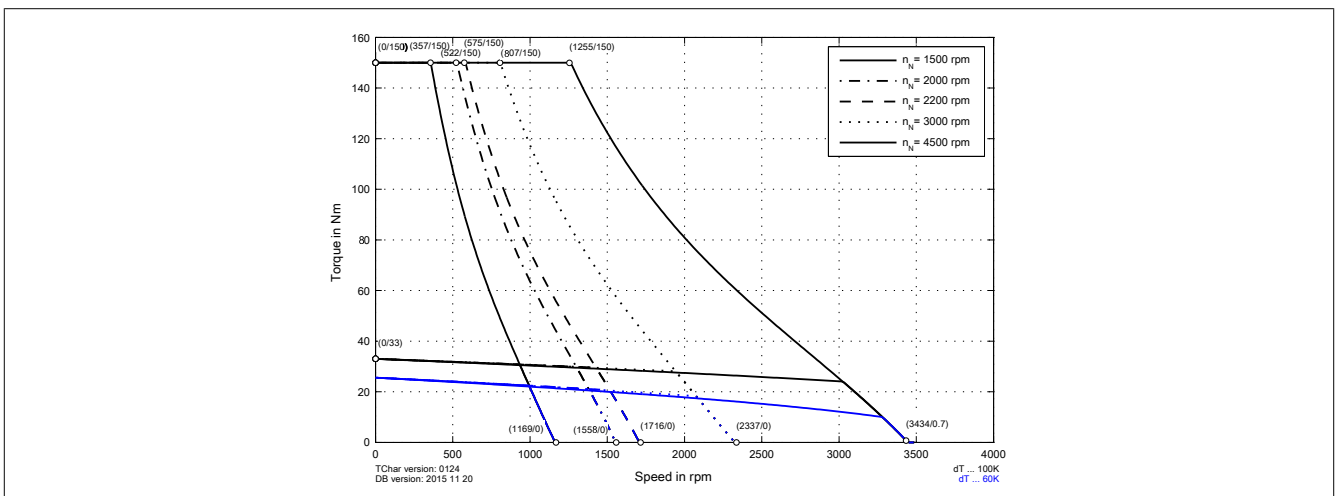
8LSA73.eennffgg-3



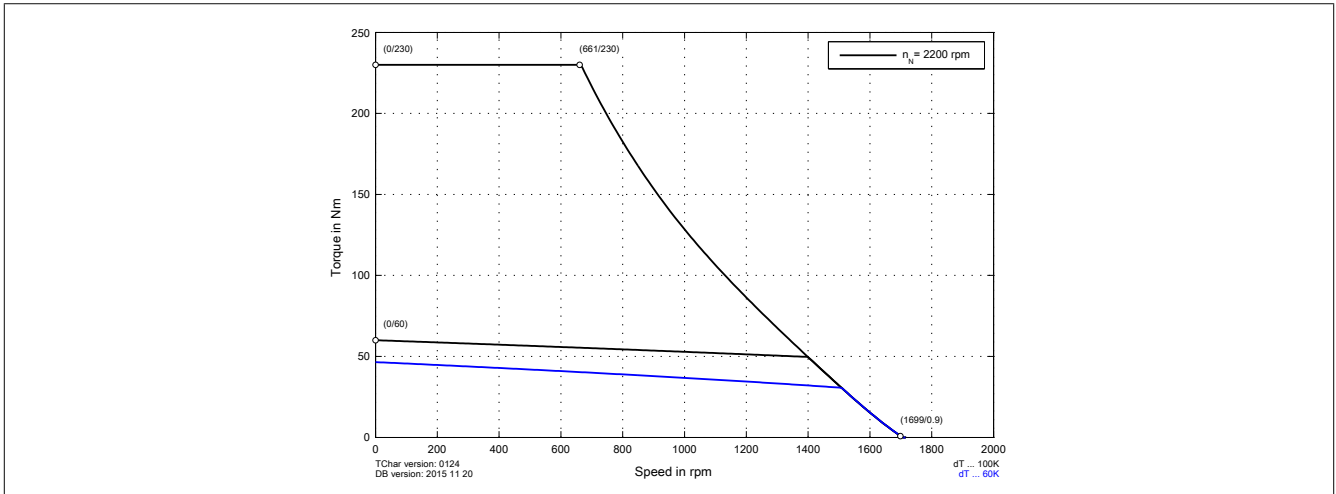
8LSA74.eennffgg-3



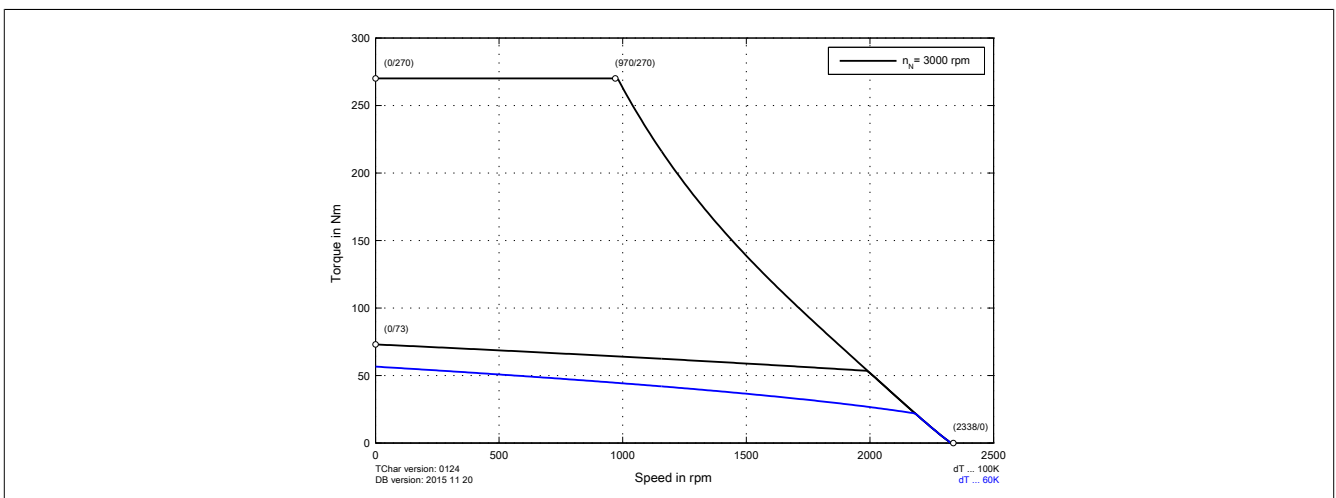
8LSA75.eennffgg-3



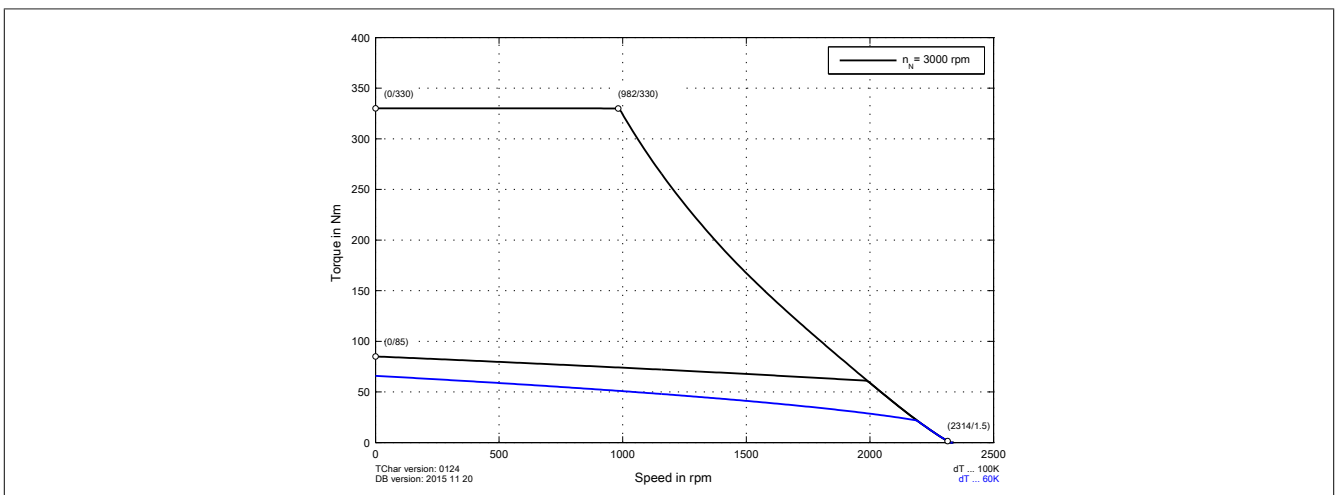
8LSA76.eennffgg-3



8LSA77.eennffgg-3

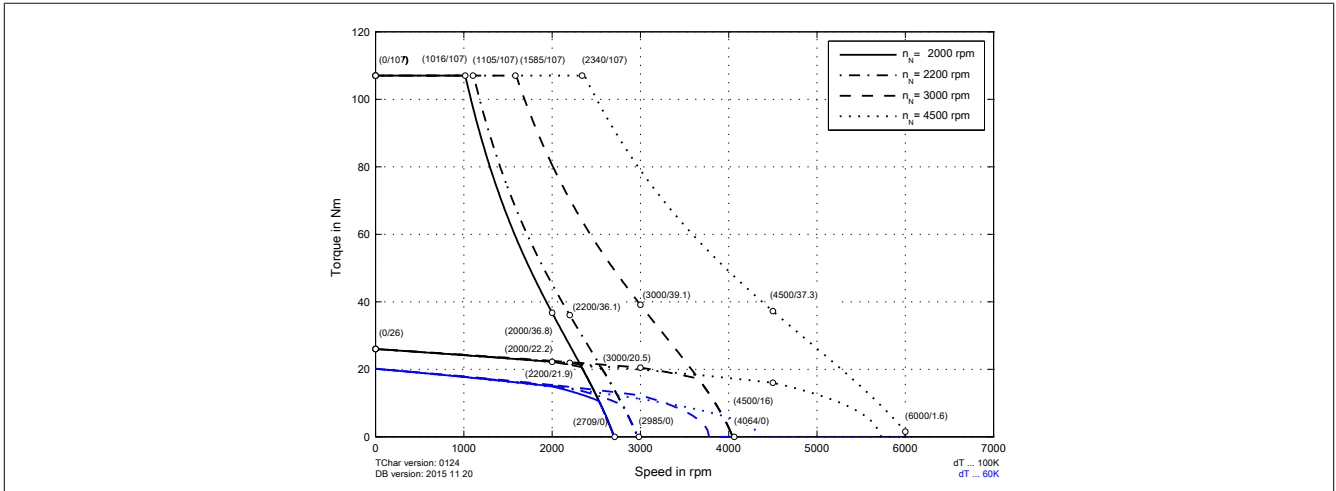


8LSA78.eennffgg-3

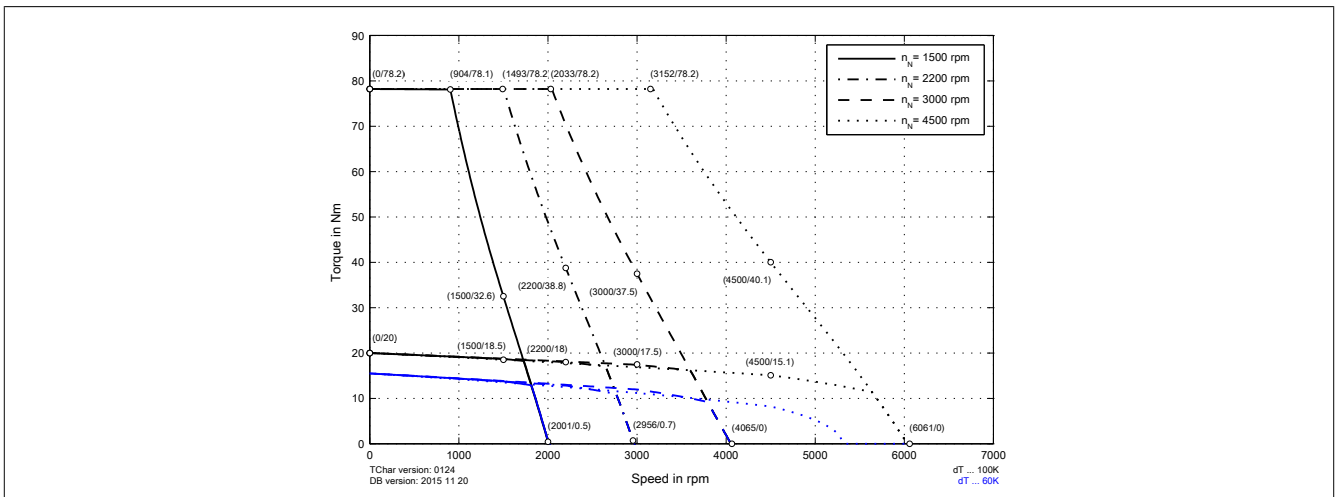


### 2.7.6.2 Speed-torque characteristics at DC bus voltage of 560 VDC

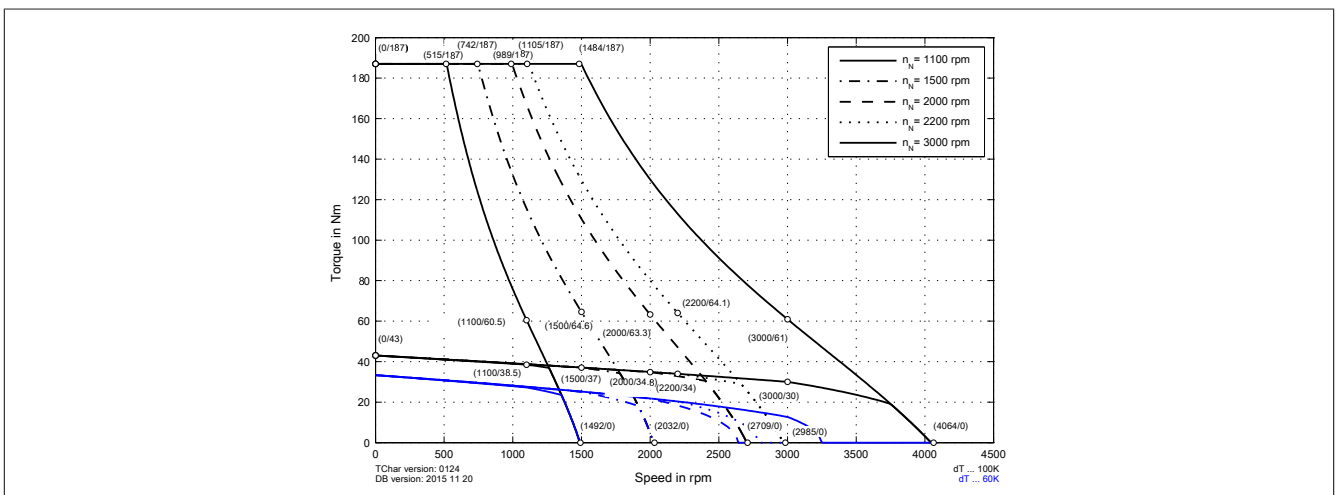
#### 8LSA73.eennffgg-3



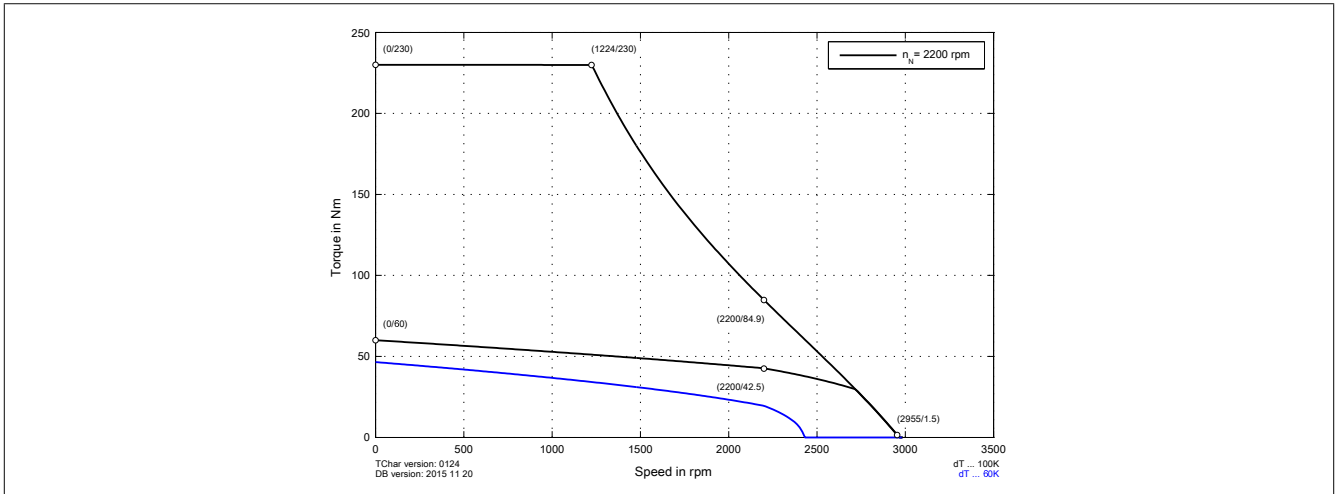
#### 8LSA74.eennffgg-3



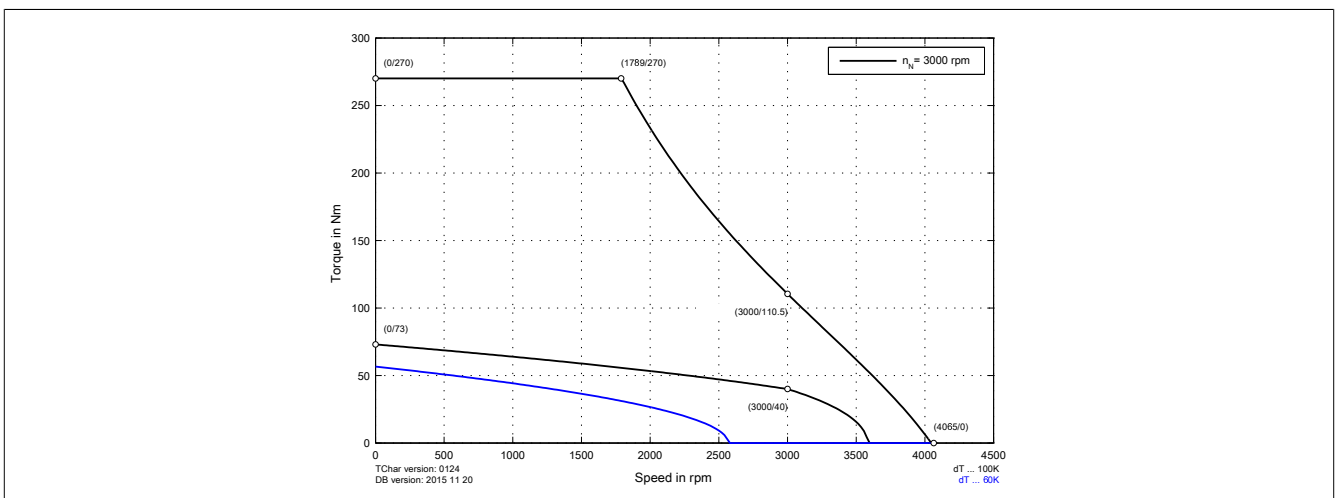
#### 8LSA75.eennffgg-3



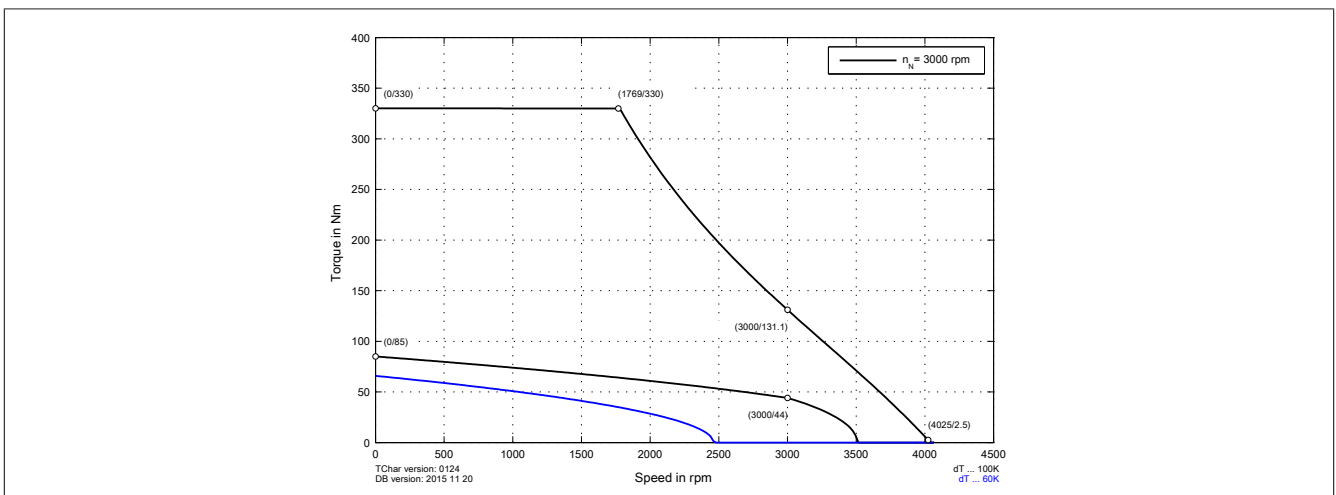
8LSA76.eennffgg-3



8LSA77.eennffgg-3

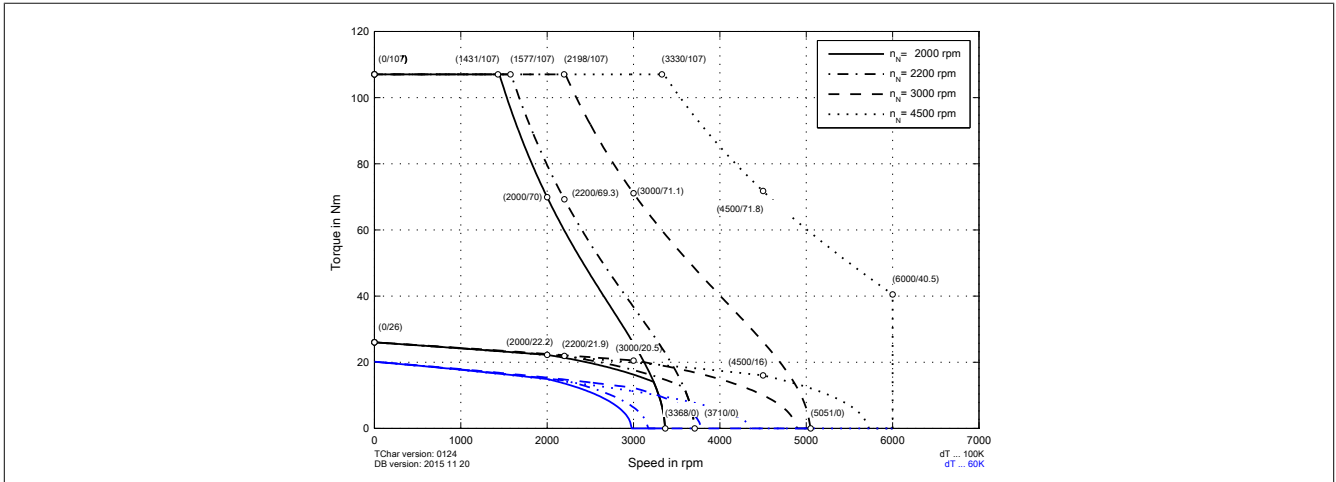


8LSA78.eennffgg-3

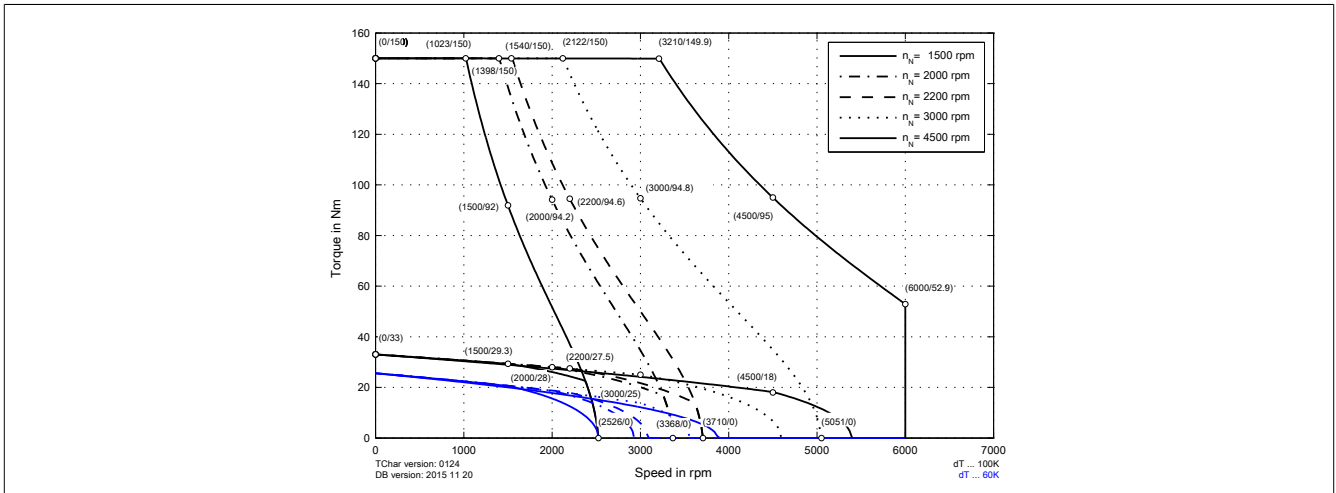


### 2.7.6.3 Speed-torque characteristics at DC bus voltage of 750 VDC

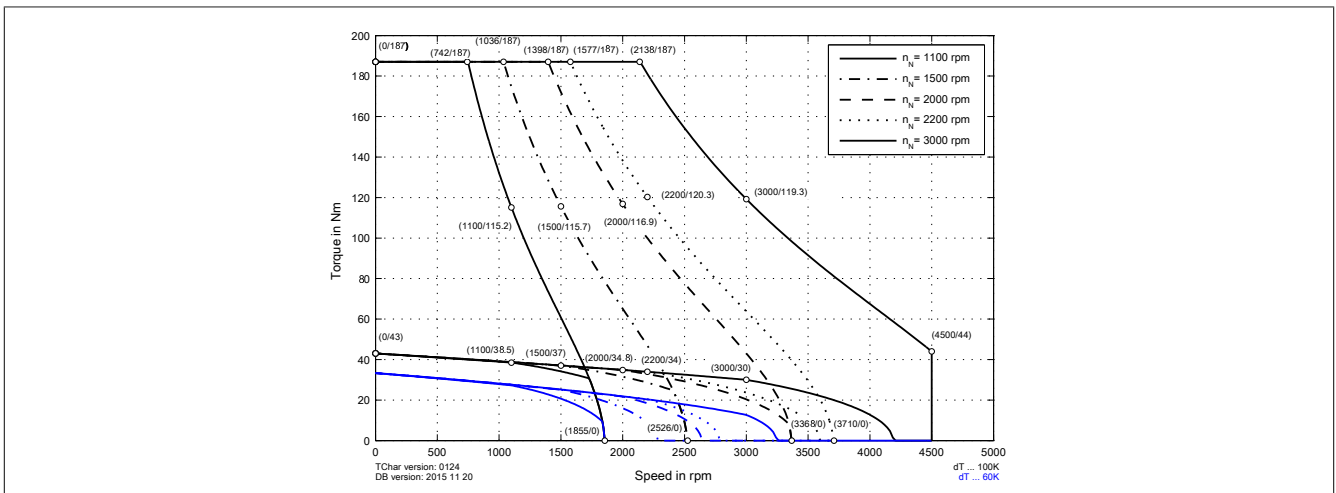
#### 8LSA73.eennffgg-3



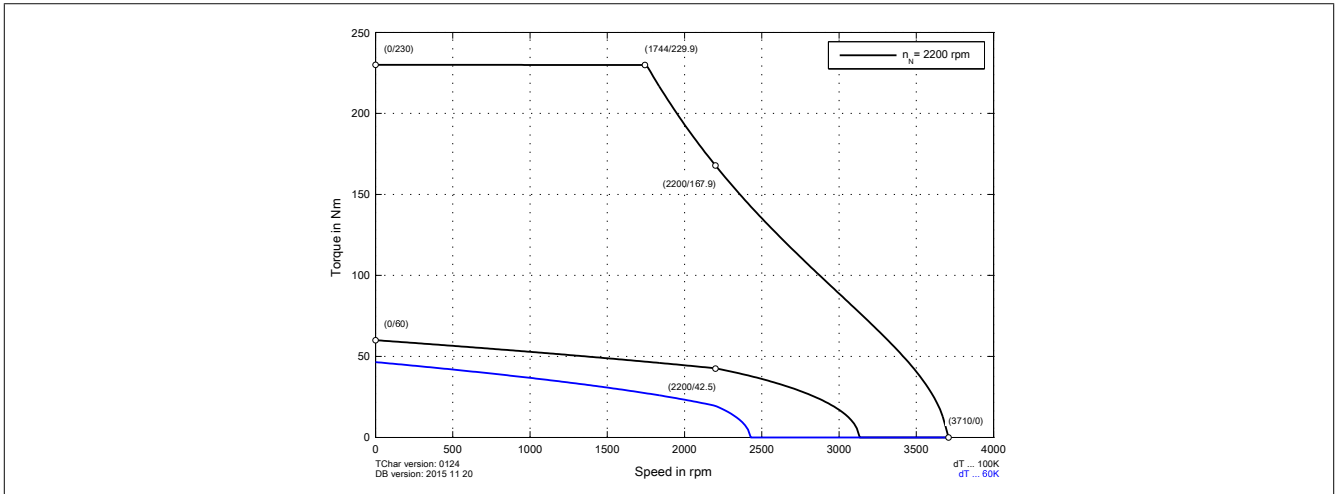
#### 8LSA74.eennffgg-3



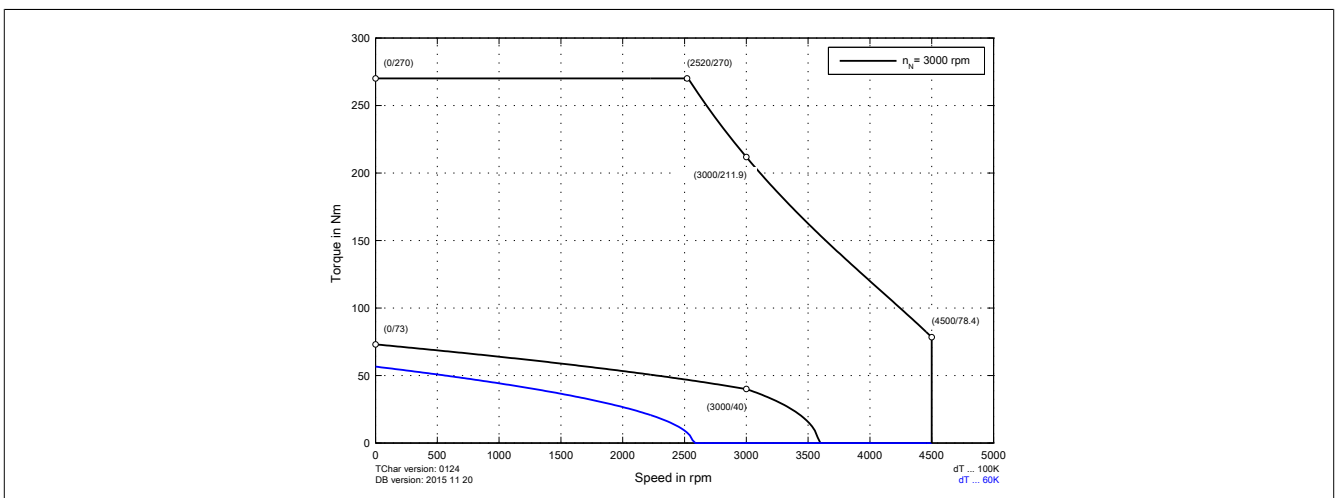
#### 8LSA75.eennffgg-3



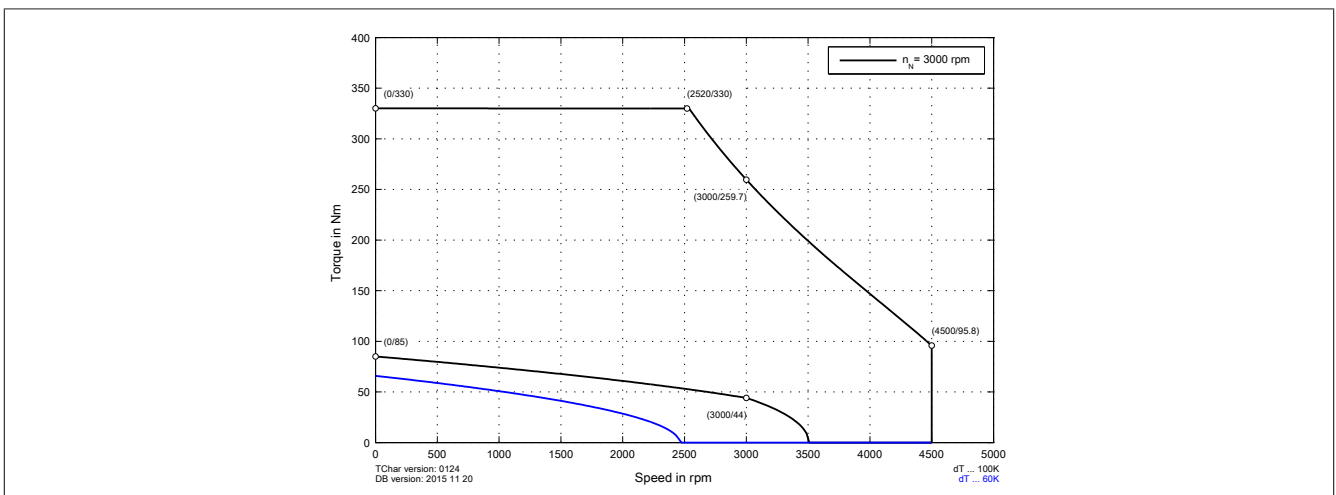
8LSA76.eennffgg-3



8LSA77.eennffgg-3



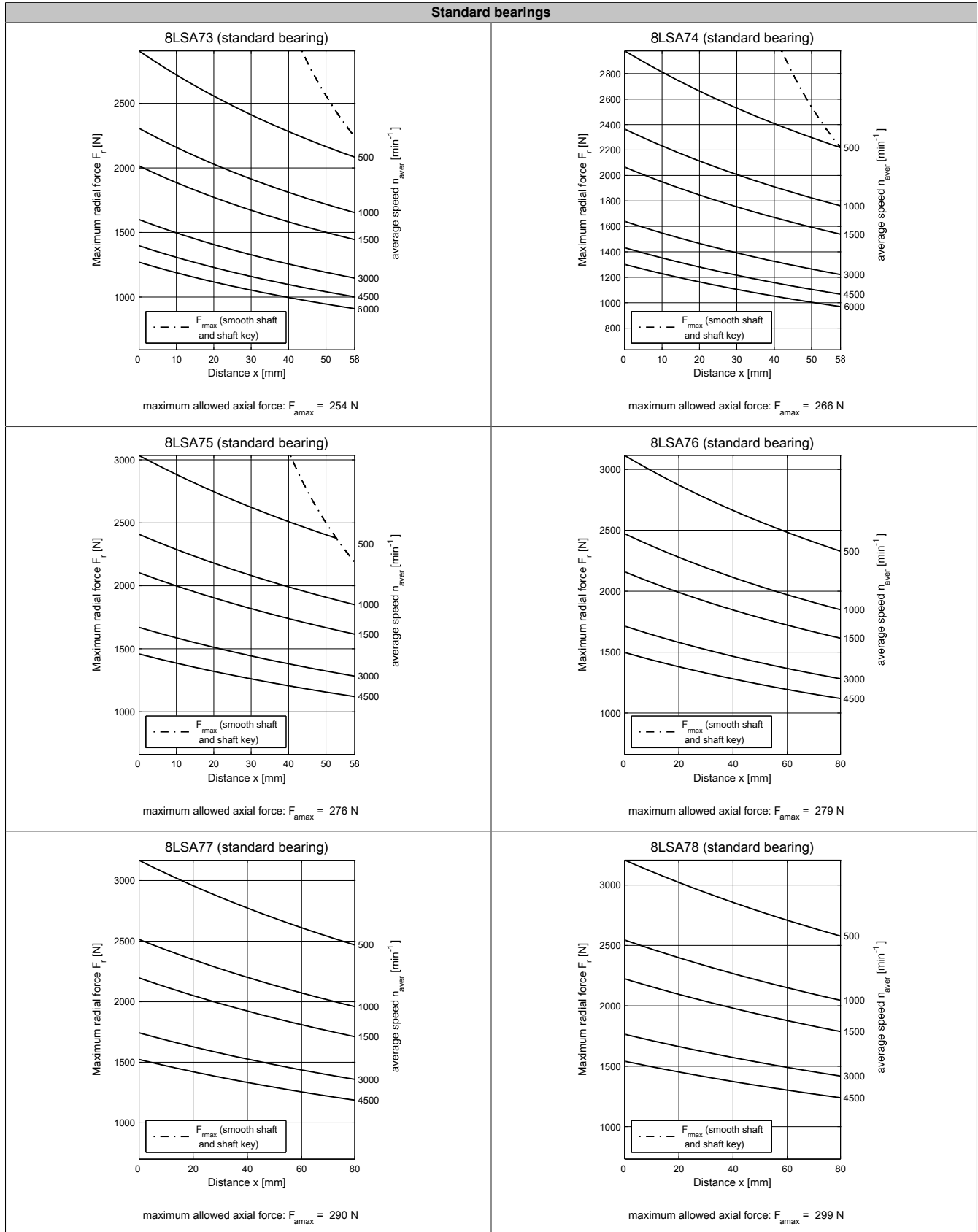
8LSA78.eennffgg-3



### 2.7.6.4 Permissible shaft load

#### 2.7.6.4.1 8LSA/C7 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!

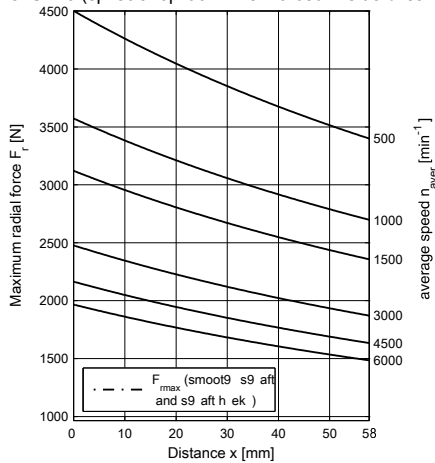


2.7.6.4.2 8LSA/C7 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!

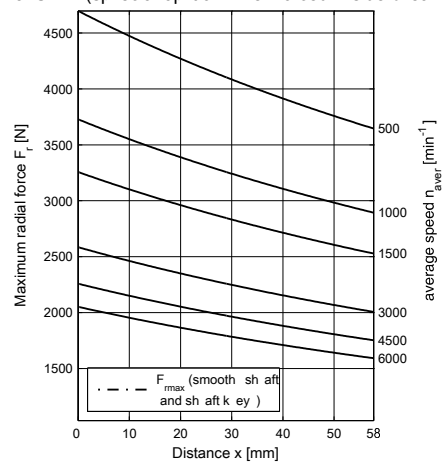
Reinforced bearings

8LSA73 (special option " reinforced A side bearing)



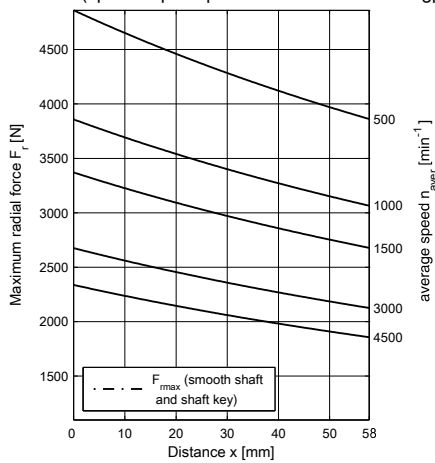
maximum allowed axial force  $F_{amax,y} = 405 \text{ N}$

8LSA74 (special option " reinforced A side bearing)



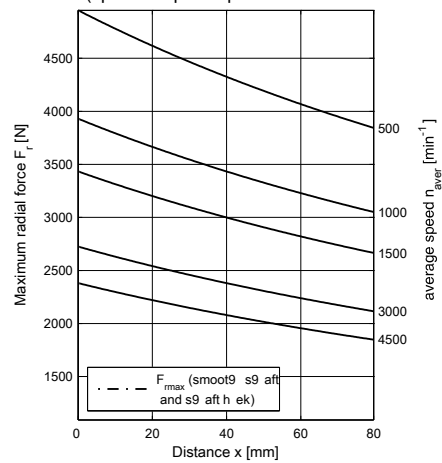
maximum allowed axial force  $F_{amax,y} = 429 \text{ N}$

8LSA75 (special option p reinforced A side bearing)



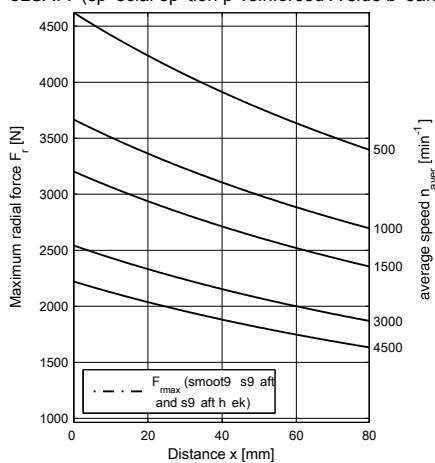
maximum allowed axial force:  $F_{amax} = 450 \text{ N}$

8LSA76 (special option p reinforced A side bearing)



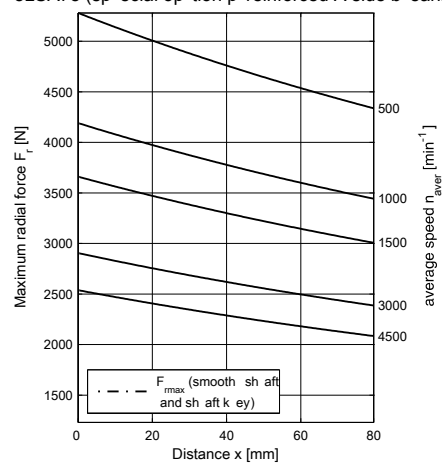
maximum allowed axial force  $F_{amax,y} = 453 \text{ N}$

8LSA77 (special option p reinforced A side bearing)



maximum allowed axial force  $F_{amax,y} = 410 \text{ N}$

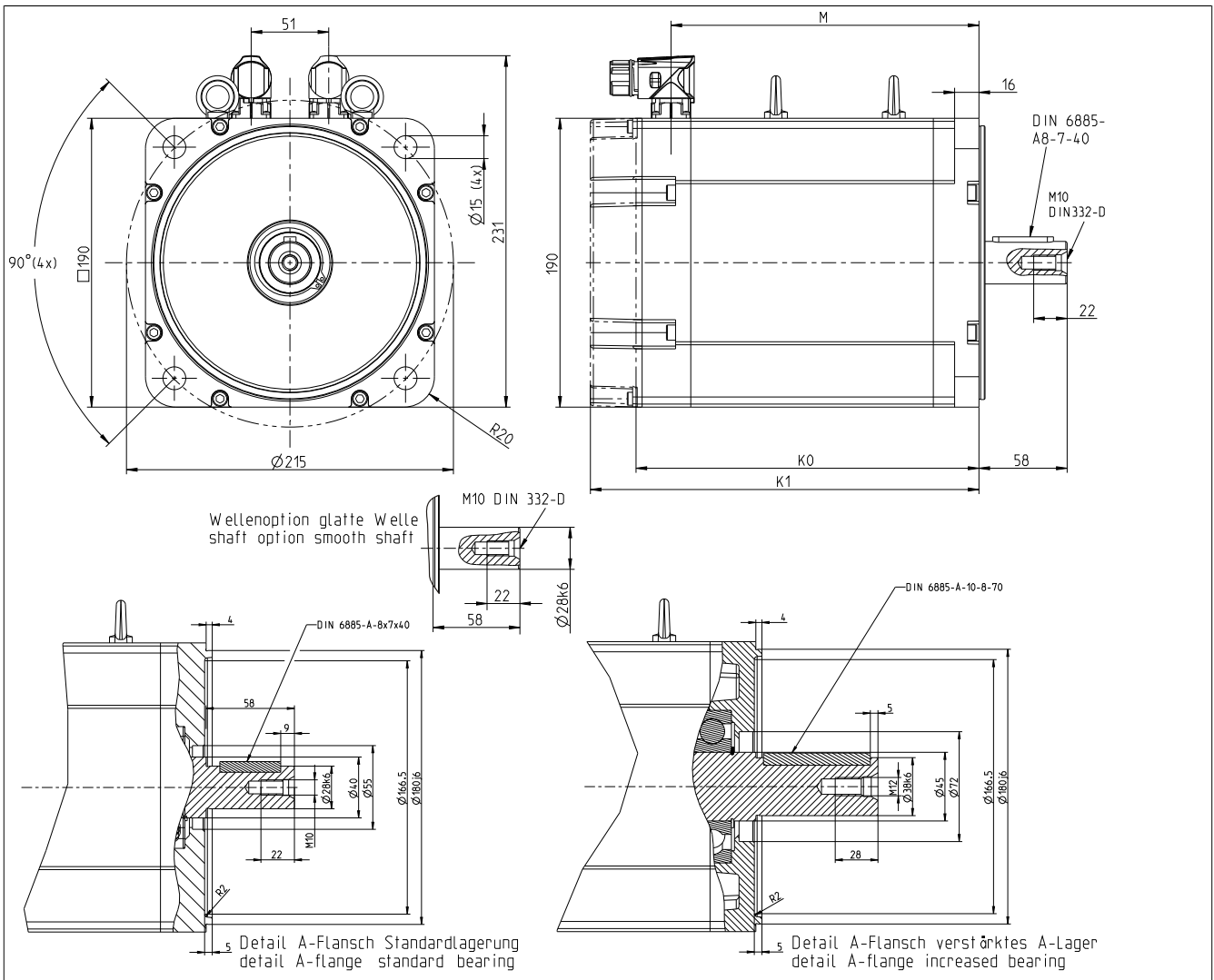
8LSA78 (special option p reinforced A side bearing)



maximum allowed axial force  $F_{amax,y} = 498 \text{ N}$



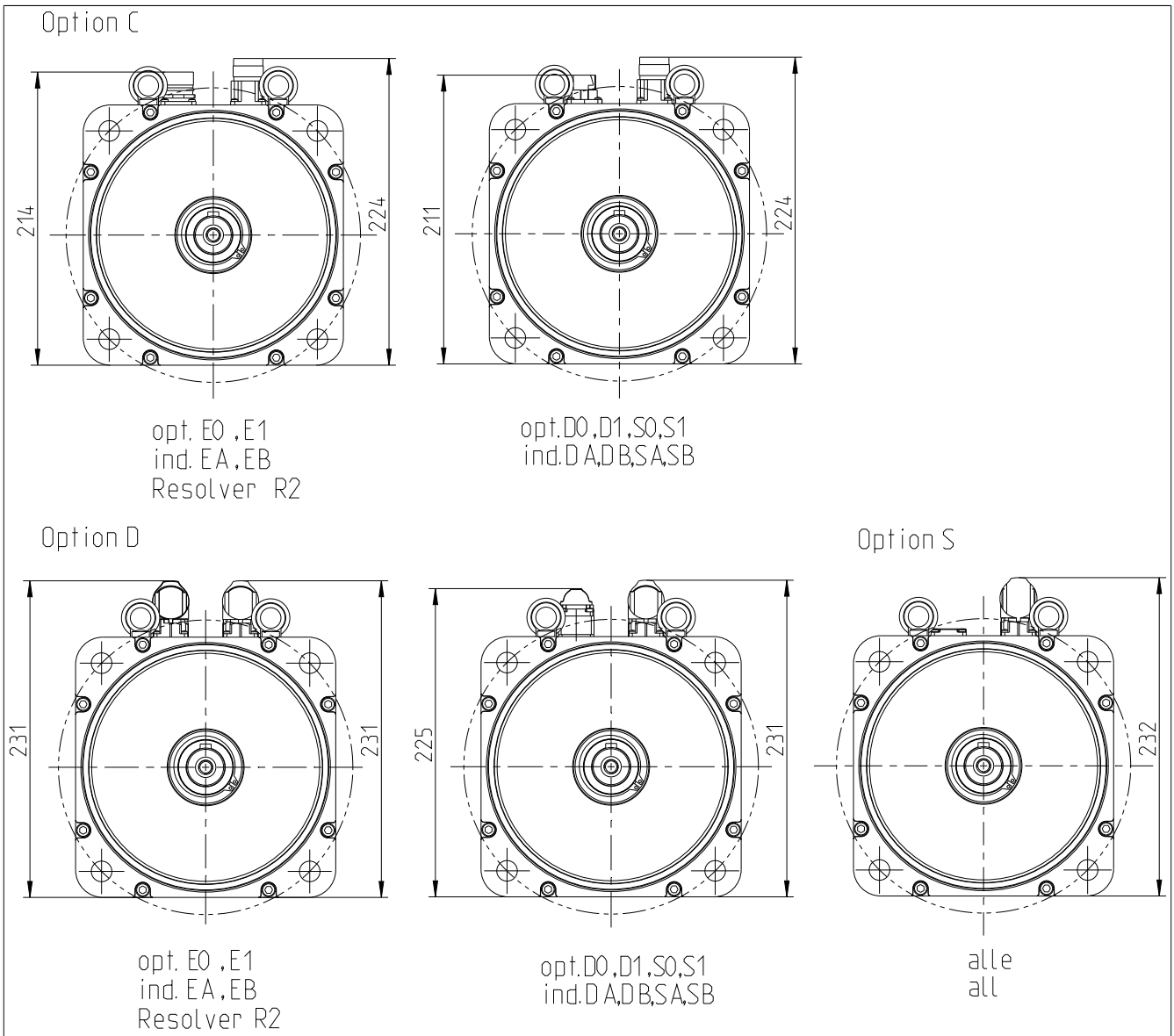
2.7.6.5 8LSA73-75 Version 3 - Dimensions



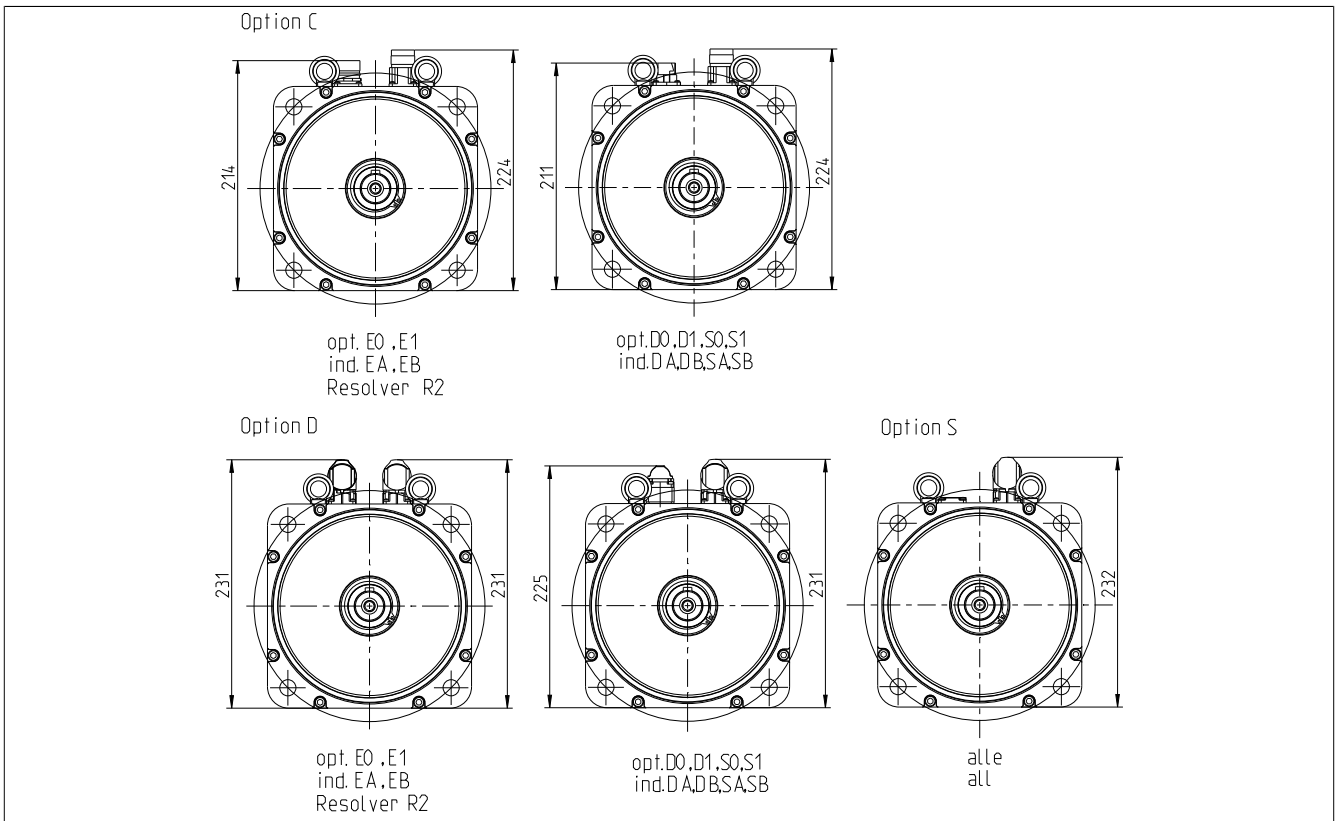
EnDat / resolver feedback				Extension of $K_0$ and $K_1$ depending on the motor option [mm]		
Encoder assignments	DA,DB,EA,EB,R2,SA,SB	D0,D1,E0,E1,S0,S1				
Model number	$K_0$	$K_1$	M	Holding brake	Heavy duty holding brake	Reinforced A side bearing
8LSA73.eennffgg-3	205	233	180	37	54	10
8LSA73.ee045ffgg-3, power connector size 1.5	On request					
8LSA74.eennffgg-3	228	256	203	37	54	10
8LSA74.ee045ffgg-3, power connector size 1.5	243.5	243.5	212	37	54	10
8LSA75.eennffgg-3	250	278	225	37	54	10

Whether or not an oil seal is used has no effect on the length of the motor.

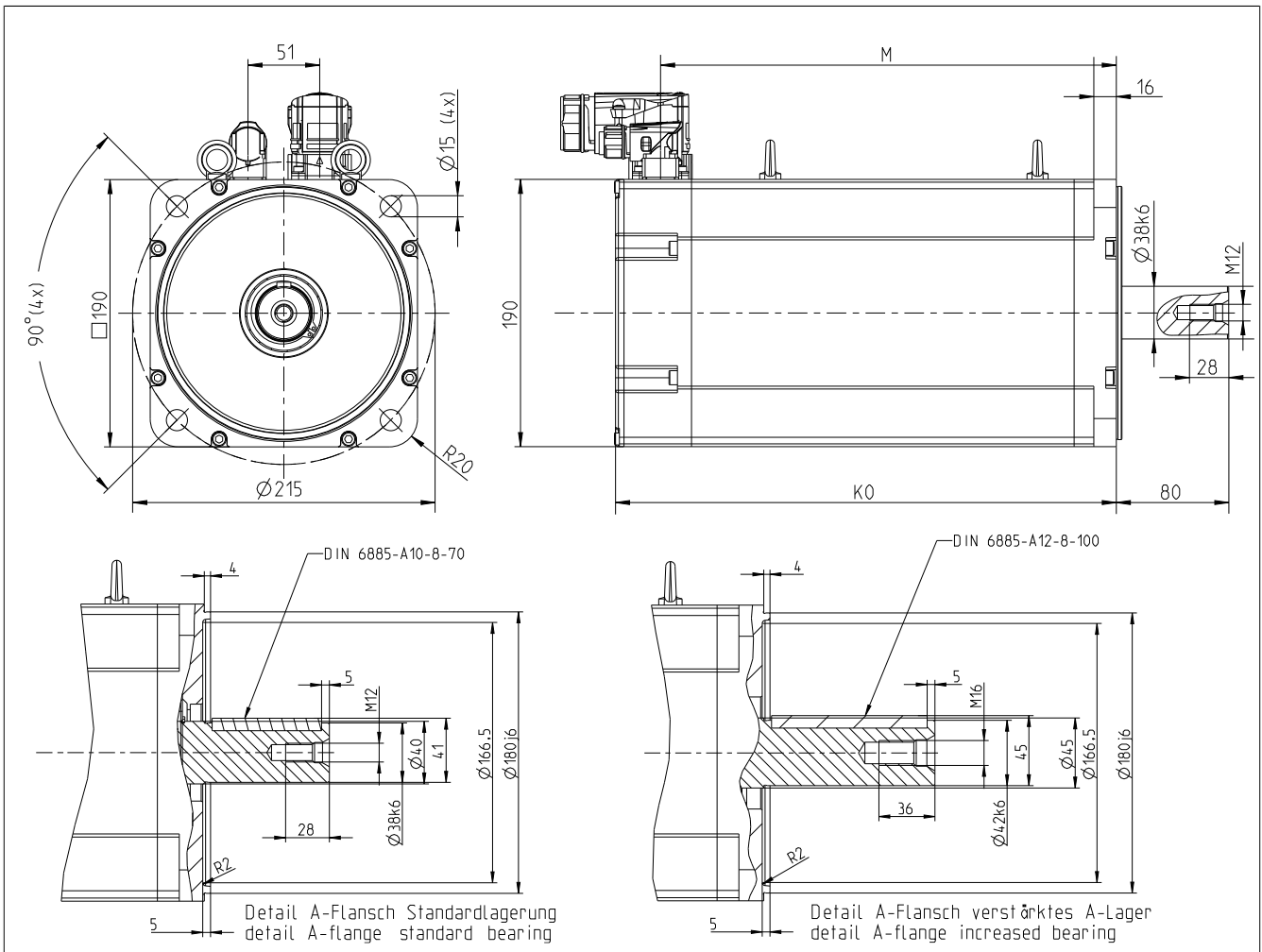
2.7.6.5.1 8LSA73-75 V3 - Connector options - Size 1.0 - Dimensions



2.7.6.5.2 8LSA73-75 V3 - Connector options - Size 1.5 - Dimensions



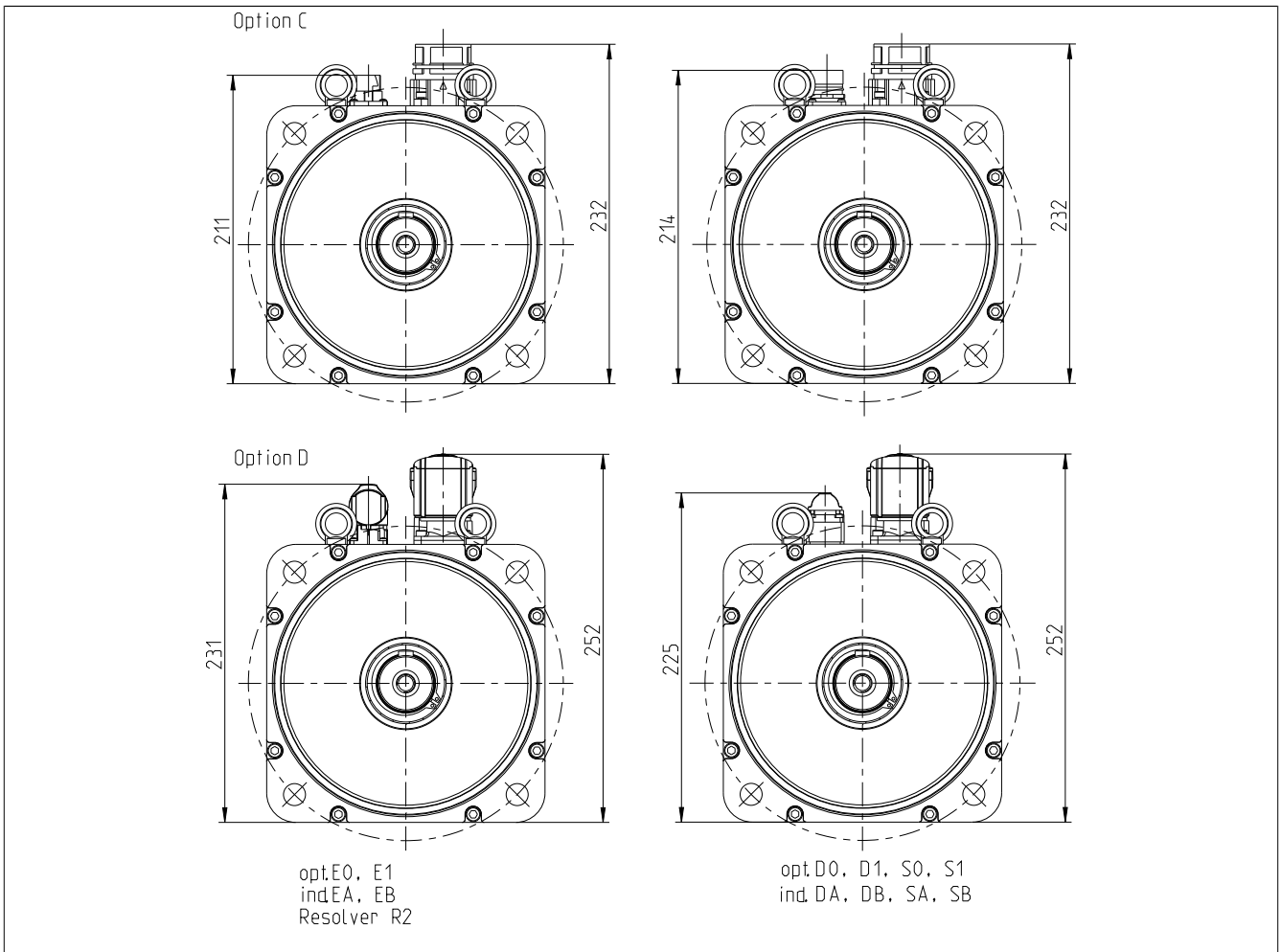
2.7.6.6 8LSA76-78 Version 3 - Dimensions



EnDat / resolver feedback			Extension of $K_0$ depending on motor option [mm]			
Model number	$K_0$	M	Holding brake	Heavy duty holding brake	Special brake	Reinforced A side bearing
8LSA76.eennffgg-3	311	279	37	54	50	10
8LSA77.eennffgg-3	356	324	37	54	50	10
8LSA78.eennffgg-3	401	369	37	54	50	10

Whether or not an oil seal is used has no effect on the length of the motor.

2.7.6.6.1 8LSA76-78 V3 - Connector options - Size 1.5 - Dimensions



## 2.7.7 Technical data - 8LSA8 V3

Model number	8LSA83. ee015ffgg-3	8LSA83. ee020ffgg-3	8LSA83. ee022ffgg-3	8LSA83. ee030ffgg-3	8LSA84. ee011ffgg-3	8LSA84. ee015ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	1500	2000	2200	3000	1100	1500
Number of pole pairs	3					
Nominal torque $M_N$ [Nm]	35	32	31	27	61	58
Nominal power $P_N$ [W]	5498	6702	7142	8482	7027	9111
Nominal current $I_N$ [A]	10.7	13.1	14	16.6	13.8	17.8
Stall torque $M_0$ [Nm]	40				69	
Stall current $I_0$ [A]	12.3	16.3	18	24.5	15.6	21.2
Maximum torque $M_{max}$ [Nm]	120				204	
Maximum current $I_{max}$ [A]	50	66	72.6	102	58.1	79
Maximum speed $n_{max}$ [rpm]	3600					
Torque constant $K_T$ [Nm/A]	3.26	2.45	2.22	1.63	4.43	3.26
Voltage constant $K_E$ [V/1000 rpm]	196.87	147.65	134.04	98.44	268.08	196.87
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.95	0.58	0.45	0.26	0.83	0.43
Stator inductance $L_{zph}$ [mH]	18	13.8	10.5	6.1	25.2	15.8
Electrical time constant $t_{el}$ [ms]	18.9	23.8	23.3	23.5	30.4	36.7
Thermal time constant $t_{therm}$ [min]	50				65	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	65				114	
Mass without brake $m$ [kg]	43				61	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	130					
Brake mass [kg]	7					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	53					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180		1320		1180	1320
ACOPOS multi inverter module 8BVlxxxx...	0110	0220		0330	0220	0330
Cross section for B&R motor cables [mm <sup>2</sup> ]	4					
Connector type	speedtec					
Connector size	1.5					

Table 66: 8LSA83.ee015ffgg-3, 8LSA83.ee020ffgg-3, 8LSA83.ee022ffgg-3, 8LSA83.ee030ffgg-3, 8LSA84.ee011ffgg-3, 8LSA84.ee015ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSA84. ee020ffgg-3	8LSA84. ee022ffgg-3	8LSA84. ee030ffgg-3	8LSA85. ee011ffgg-3	8LSA85. ee015ffgg-3	8LSA85. ee020ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2000	2200	3000	1100	1500	2000
Number of pole pairs	3					
Nominal torque $M_N$ [Nm]	53	51.5	48.4	81.5	77	72
Nominal power $P_N$ [W]	11100	11865	15205	9388	12095	15080
Nominal current $I_N$ [A]	21.6	23.2	29.7	18.6	23.6	29.4
Stall torque $M_0$ [Nm]	69			94		
Stall current $I_0$ [A]	28.2	31.1	42.3	21.46	28.9	38.4
Maximum torque $M_{max}$ [Nm]	204			280		
Maximum current $I_{max}$ [A]	105	115.5	171	80	113	157
Maximum speed $n_{max}$ [rpm]	3600					
Torque constant $K_T$ [Nm/A]	2.45	2.22	1.63	4.38	3.26	2.45
Voltage constant $K_E$ [V/1000 rpm]	147.65	134.04	98.44	268.08	196.87	147.65
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.27	0.22	0.12	0.66	0.328	0.168
Stator inductance $L_{zph}$ [mH]	8.9	7.4	3.9	19.1	9.44	4.85
Electrical time constant $t_{el}$ [ms]	33	33.6	32.5	28.9	28.5	28.9
Thermal time constant $t_{therm}$ [min]	65			80		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	114			150		
Mass without brake $m$ [kg]	61			75.5		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	130					
Brake mass [kg]	7					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	53					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1320	1640		1320	1640	
ACOPOS multi inverter module 8BVxxxx...	0330	0440	0660	0330	0440	
Cross section for B&R motor cables [mm <sup>2</sup> ]	4		10	4		10
Connector type	speedtec					
Connector size	1.5					

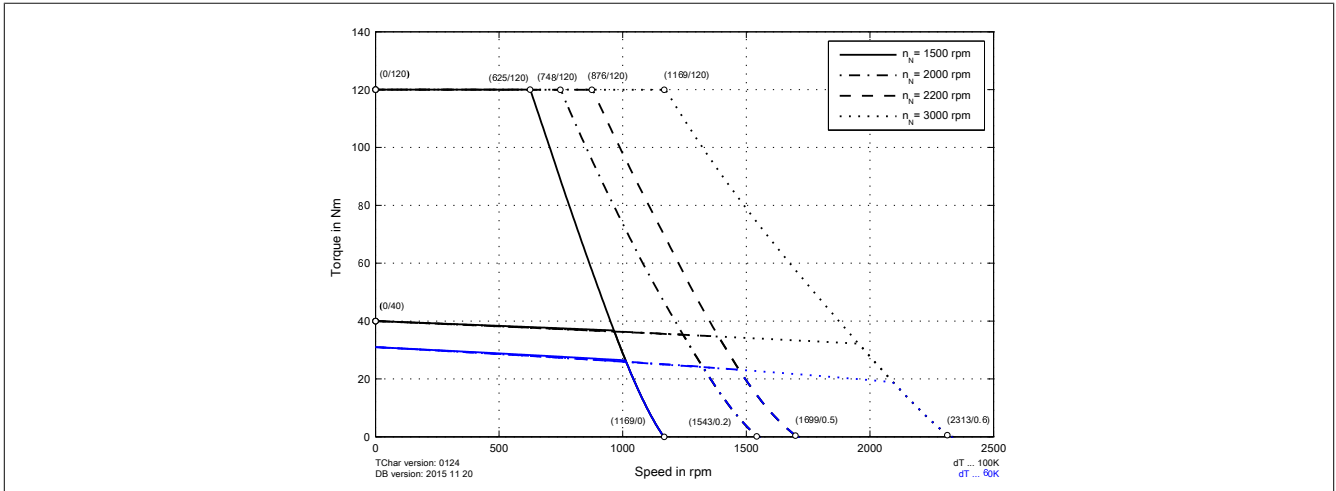
Table 67: 8LSA84.ee020ffgg-3, 8LSA84.ee022ffgg-3, 8LSA84.ee030ffgg-3, 8LSA85.ee011ffgg-3, 8LSA85.ee015ffgg-3, 8LSA85.ee020ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

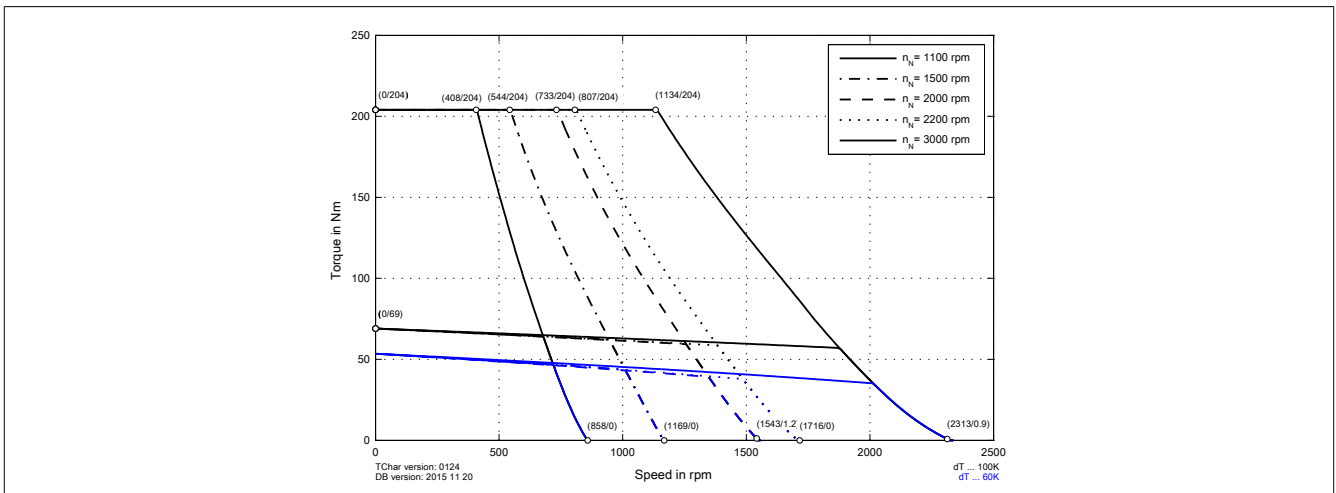
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

### 2.7.7.1 Speed-torque characteristics at DC bus voltage of 325 VDC

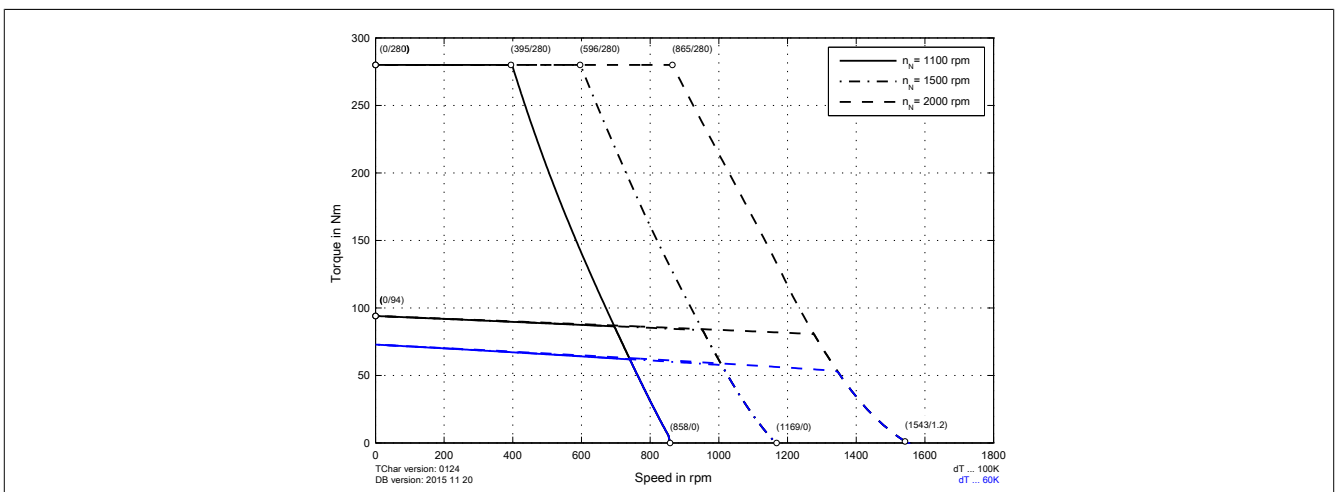
#### 8LSA83.eennffgg-3



#### 8LSA84.eennffgg-3

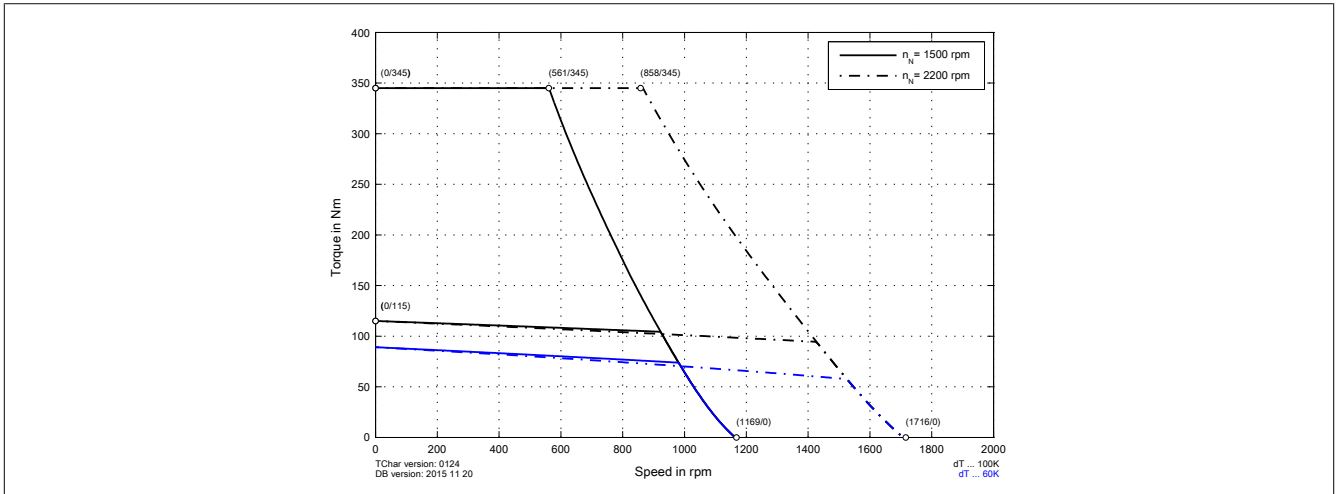


#### 8LSA85.eennffgg-3



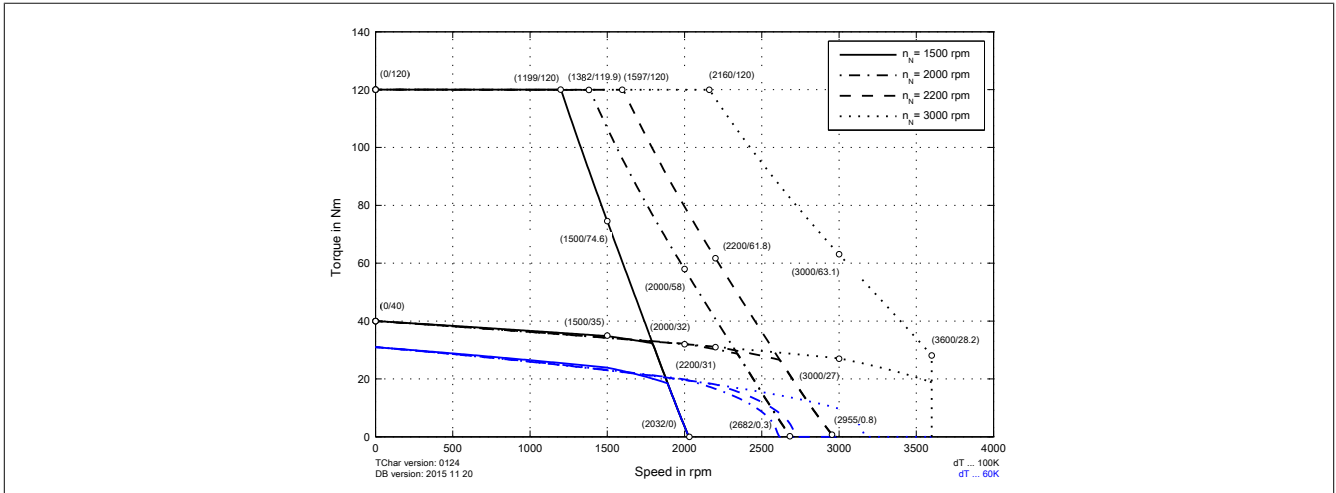


8LSA86.eennffgg-3

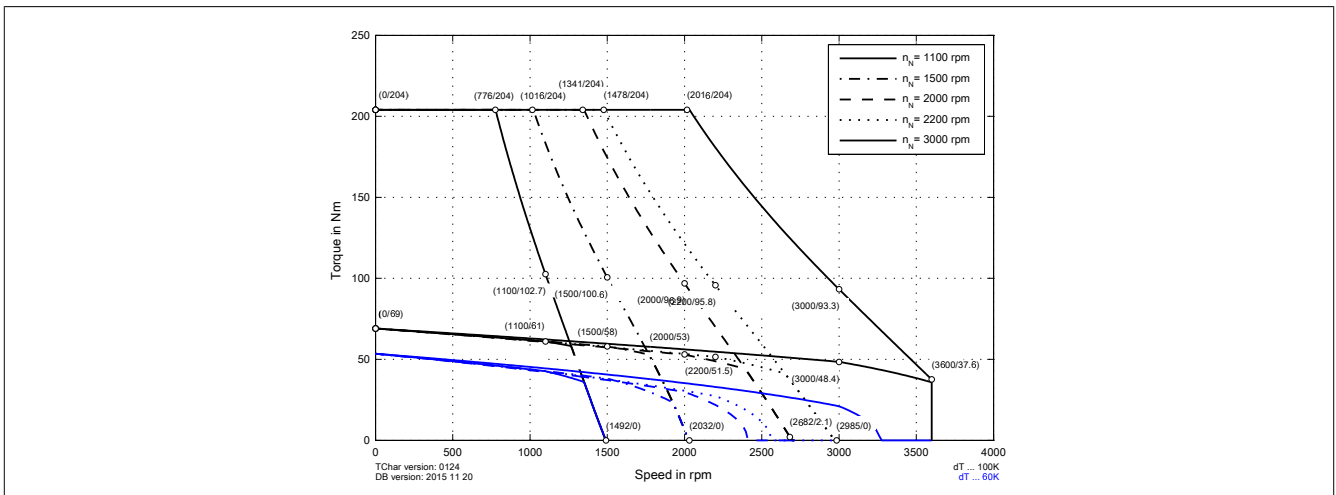


### 2.7.7.2 Speed-torque characteristics at DC bus voltage of 560 VDC

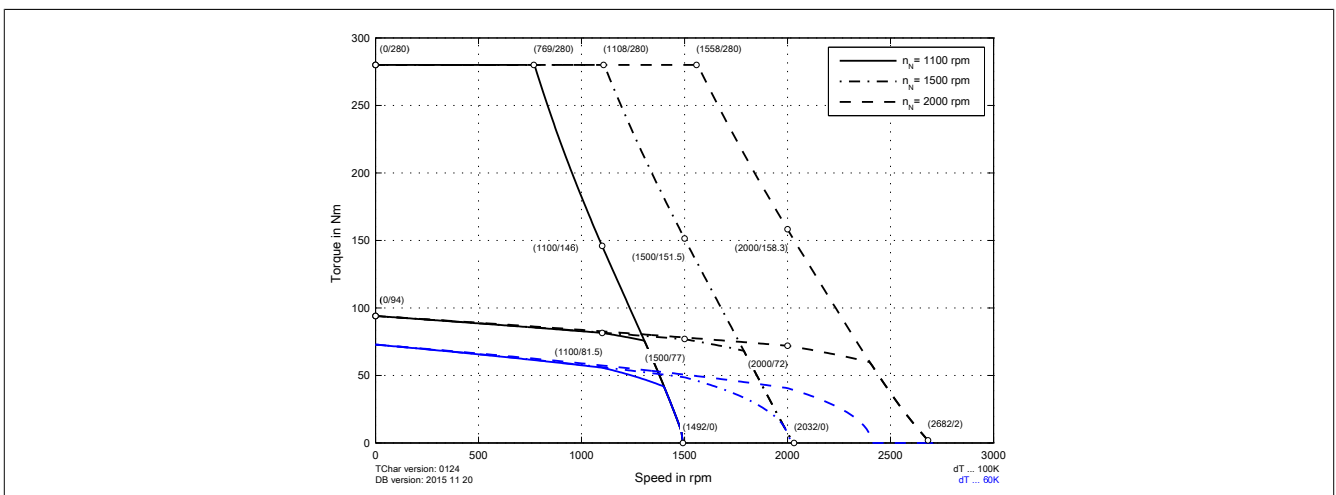
#### 8LSA83.eennffgg-3



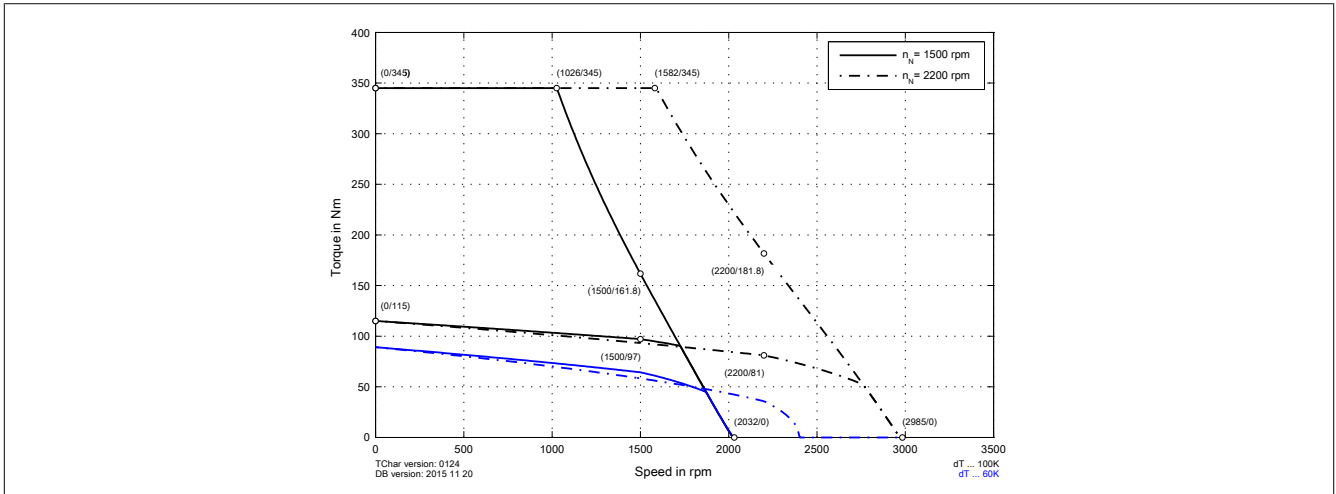
#### 8LSA84.eennffgg-3



#### 8LSA85.eennffgg-3

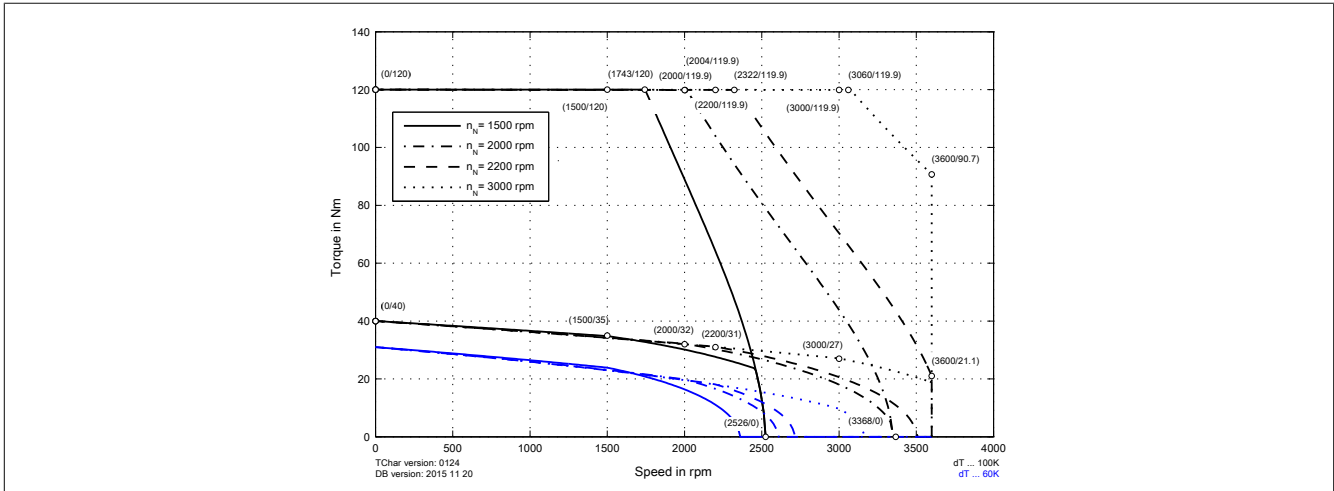


8LSA86.eennffgg-3

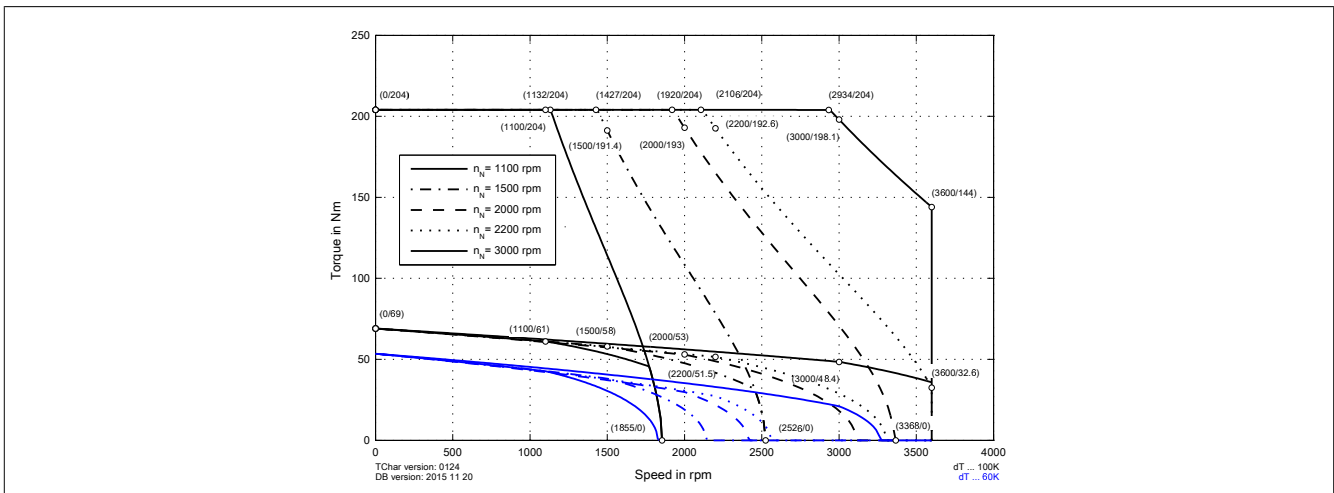


### 2.7.7.3 Speed-torque characteristics at DC bus voltage of 750 VDC

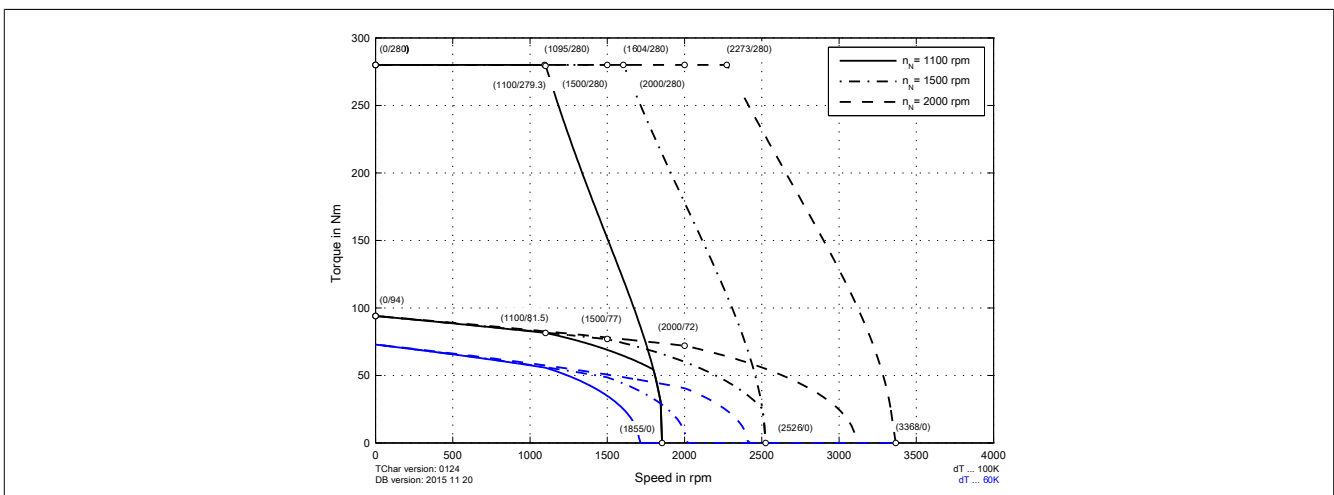
#### 8LSA83.eennffgg-3



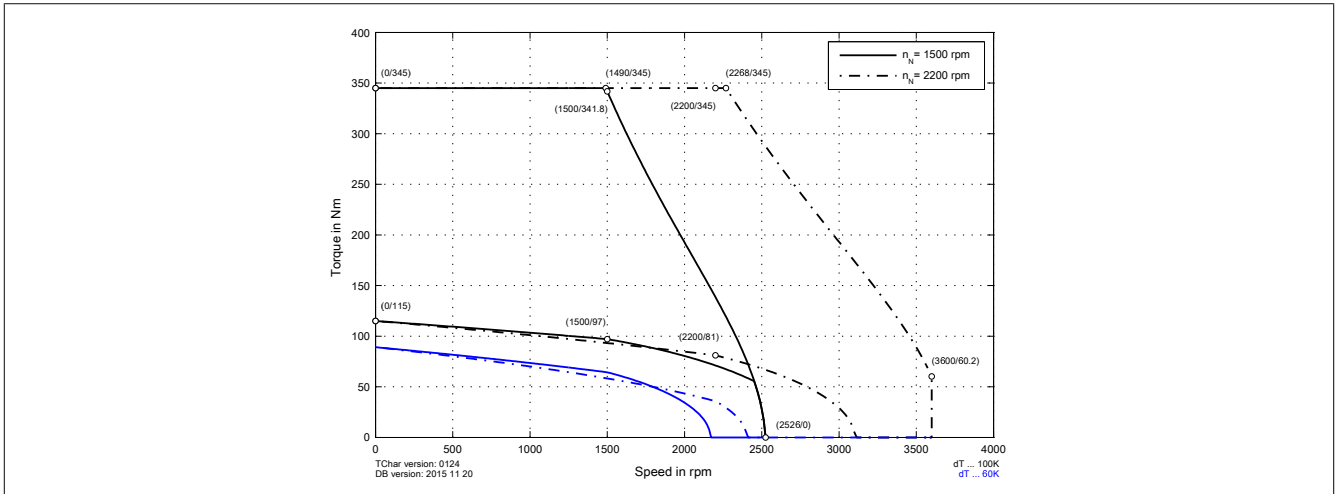
#### 8LSA84.eennffgg-3



#### 8LSA85.eennffgg-3



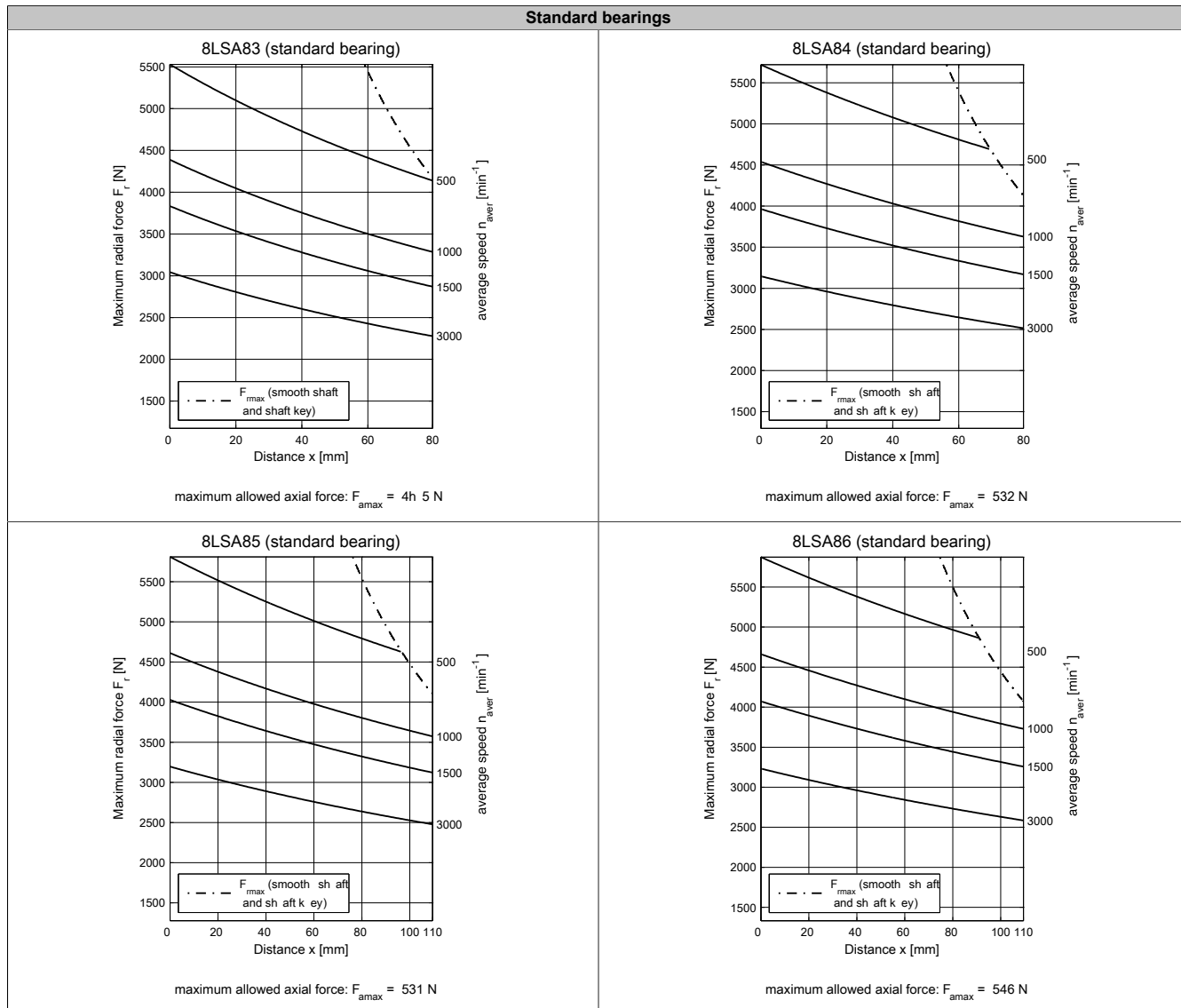
8LSA86.eennffgg-3



### 2.7.7.4 Permissible shaft load

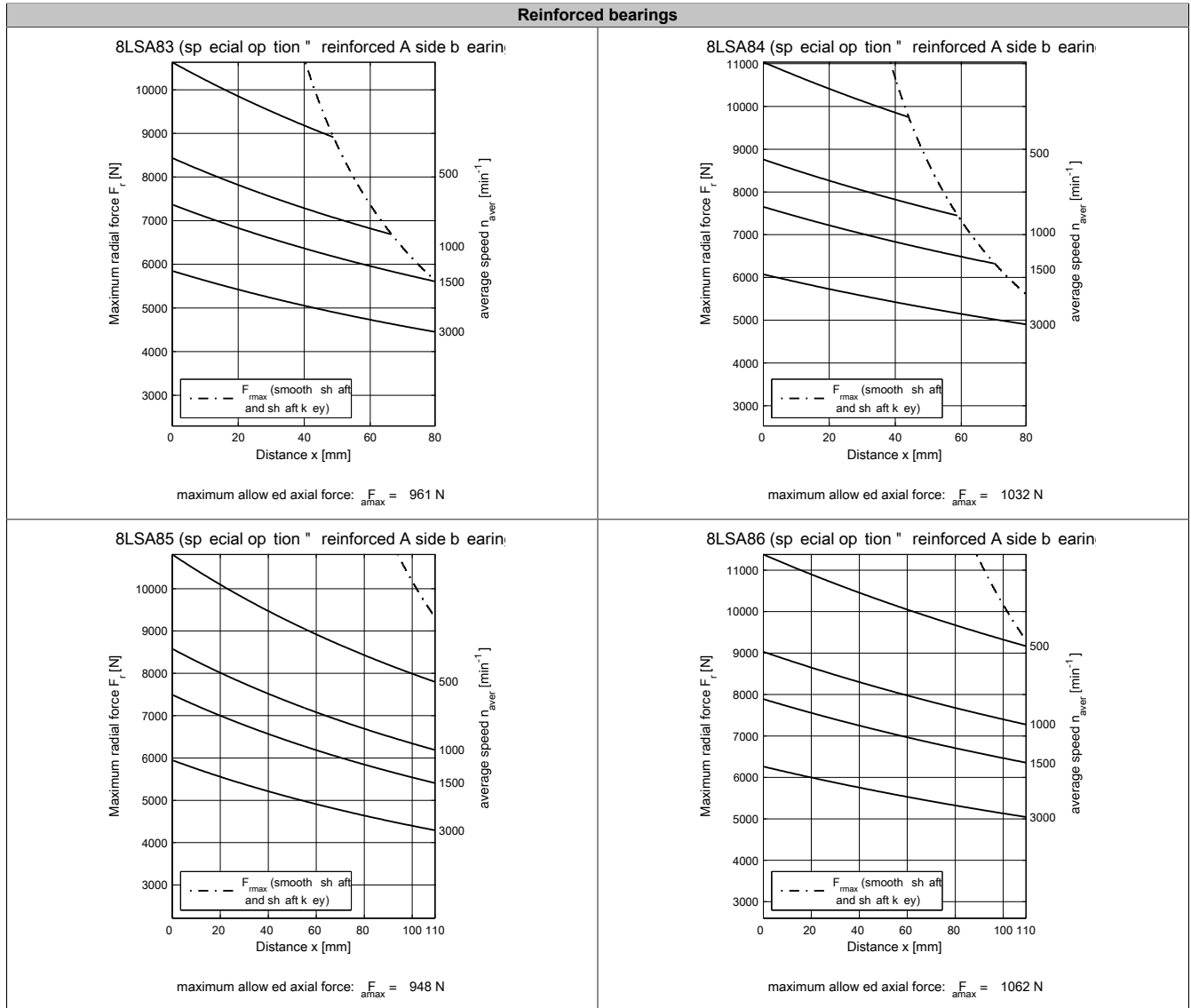
#### 2.7.7.4.1 8LSA/C8 V3 - Permissible shaft load (standard bearing)

Shaft load values apply to both 8LSA and 8LSC!

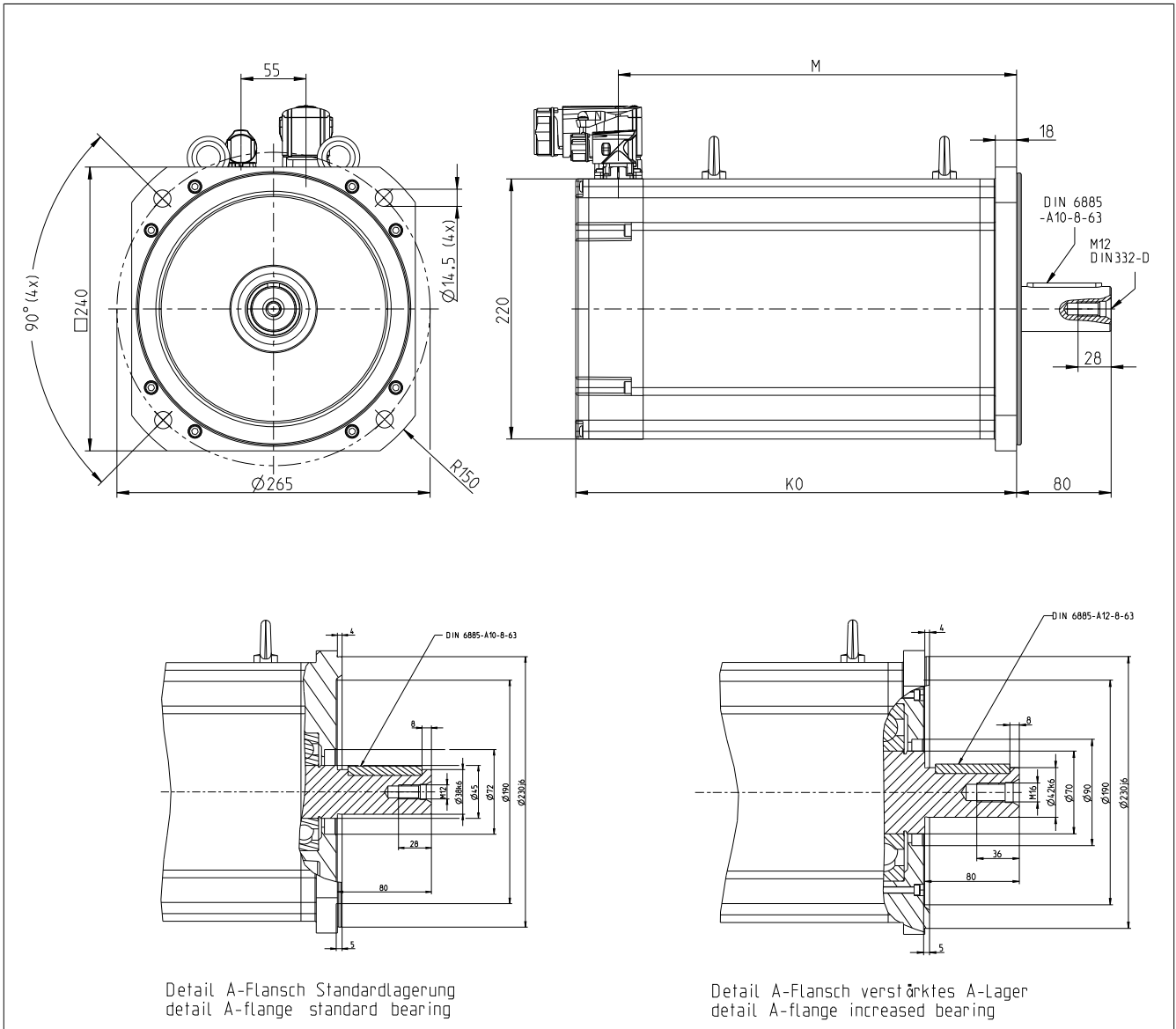


2.7.7.4.2 8LSA/C8 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!



2.7.7.5 8LSA8 V3 - Dimensions



Detail A-Flansch Standardlager  
detail A-flange standard bearing

Detail A-Flansch verstärktes A-Lager  
detail A-flange increased bearing

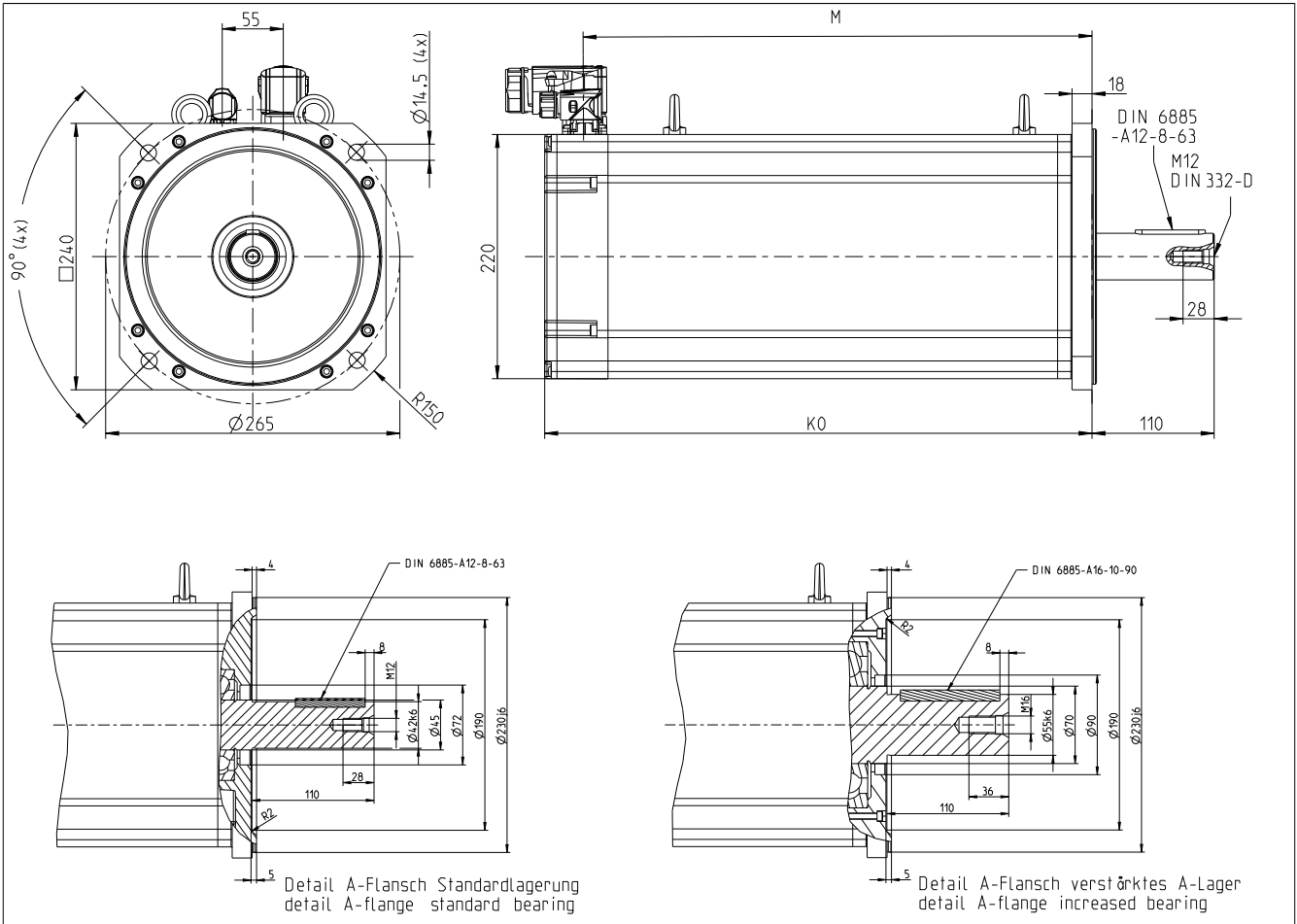
Optical EnDat feedback			Extension of $K_0$ depending on motor option [mm]		
Model number	$K_0$	M	Holding brake <sup>1)</sup>	Oil seal	Reinforced A-side bearing
8LSA83.eennffgg-3	321	259	50	---	16.5
8LSA84.eennffgg-3	401	339	50	---	16.5

Inductive EnDat/resolver feedback			Extension of $K_0$ depending on motor option [mm]		
Model number	$K_0$	M	Holding brake <sup>1)</sup>	Oil seal	Reinforced A-side bearing
8LSA83.eennffgg-3	293	259	50	---	16.5
8LSA84.eennffgg-3	373	339	50	---	16.5

<sup>1)</sup> The motor option "holding brake" cannot be ordered in combination with special motor option "Reinforced A-side bearing".





Optical EnDat feedback			Extension of $K_0$ depending on motor option [mm]		
Model number	$K_0$	M	Holding brake <sup>1)</sup>	Oil seal	Reinforced A-side bearing
8LSA85.eennffgg-3	461	399	50	---	16.5
8LSA86.eennffgg-3	521	459	50	---	16.5

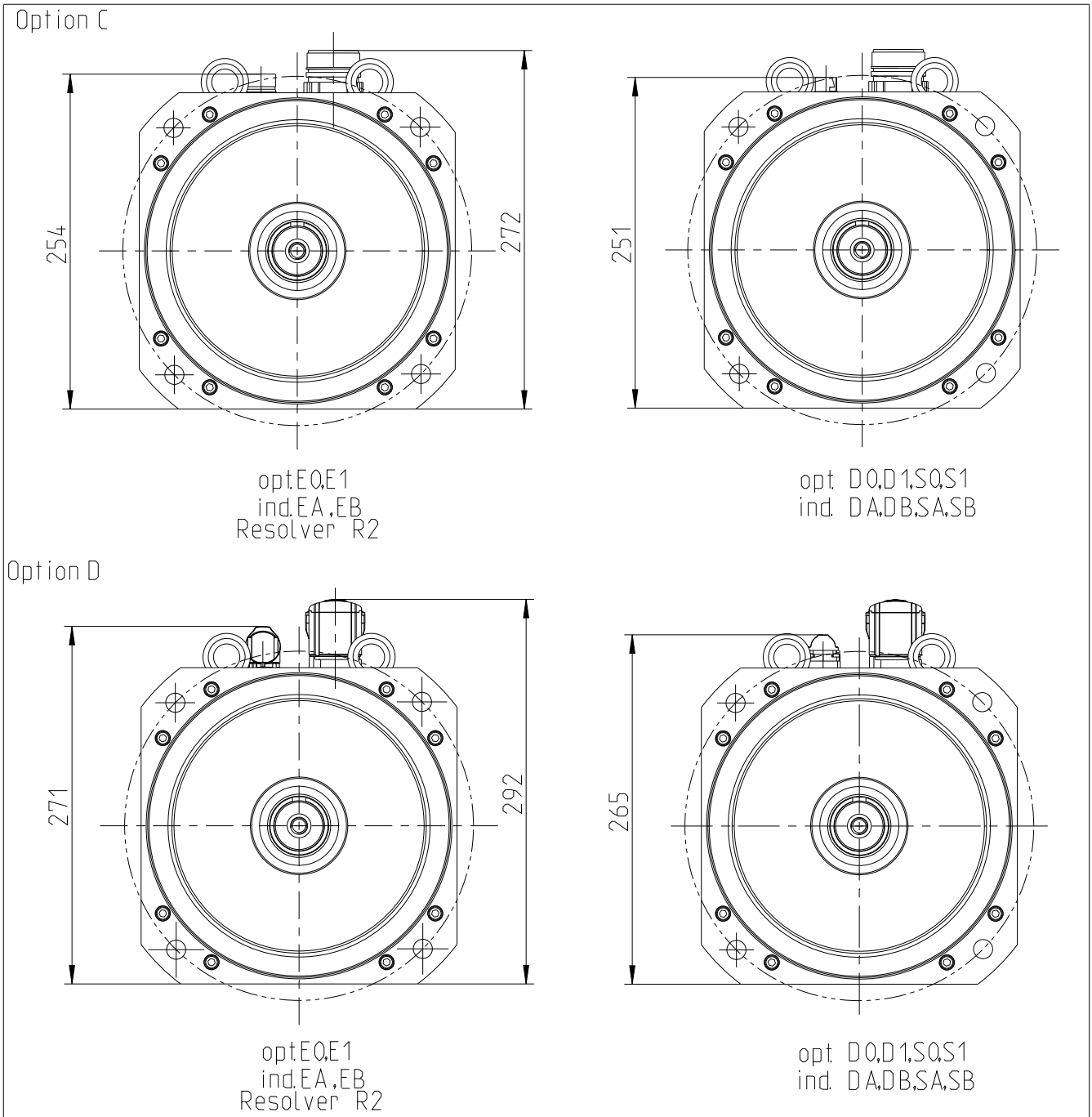
  

Inductive EnDat/resolver feedback			Extension of $K_0$ depending on motor option [mm]		
Model number	$K_0$	M	Holding brake <sup>1)</sup>	Oil seal	Reinforced A-side bearing
8LSA85.eennffgg-3	433	399	50	---	16.5
8LSA86.eennffgg-3	493	459	50	---	16.5

<sup>1)</sup> The motor option "holding brake" cannot be ordered in combination with special motor option "Reinforced A-side bearing".

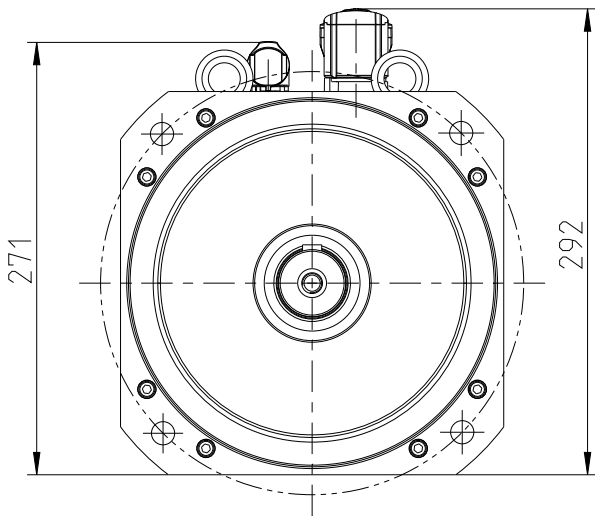
2.7.7.5.1 8LSA8 V3 - Connector options - Dimensions

8LSA83 and 8LSA84

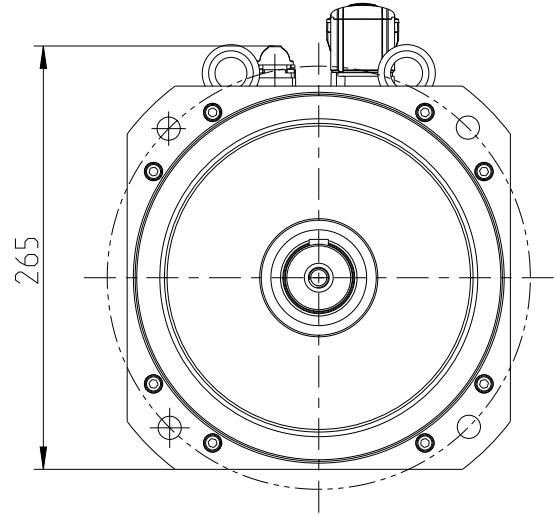


8LSA85 and 8LSA86

Option C

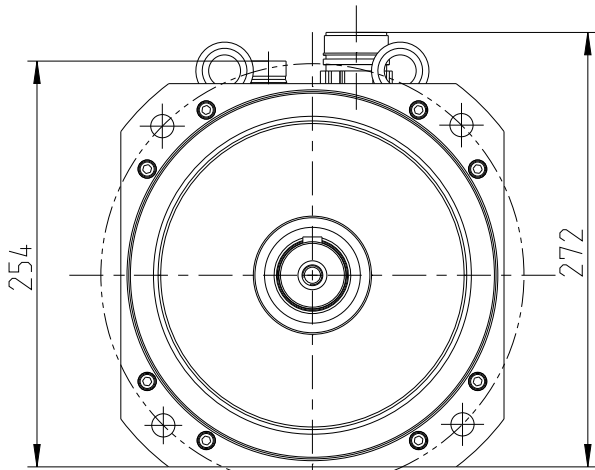


opt.EQ,E1  
ind.EA,EB  
Resolver R2

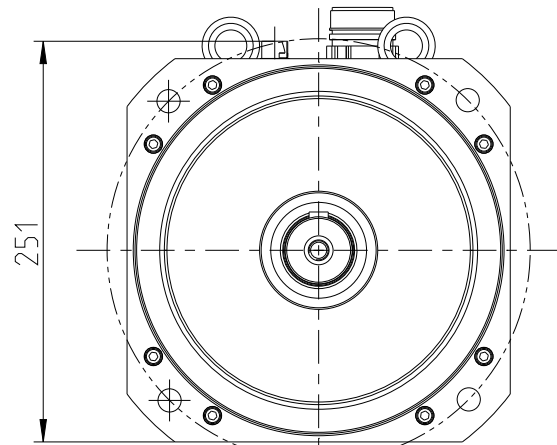


opt. D0,D1,SQ,S1  
ind. DA,DB,SA,SB

Option D



opt.EQ,E1  
ind.EA,EB  
Resolver R2



opt. D0,D1,SQ,S1  
ind. DA,DB,SA,SB

## 2.8 Technical data - Cooling type C

### 2.8.1 Technical data - 8LSC4 V3

Model number	8LSC43. ee022ffgg-3	8LSC43. ee030ffgg-3	8LSC43. ee045ffgg-3	8LSC43. ee060ffgg-3	8LSC44. ee022ffgg-3	8LSC44. ee030ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2200	3000	4500	6000	2200	3000
Number of pole pairs	5					
Nominal torque $M_n$ [Nm]	4.55	4.03	3.51	2.6	6.76	6.01
Nominal power $P_N$ [W]	1048	1266	1654	1634	1557	1888
Nominal current $I_N$ [A]	2.1	2.5	3.2	3.19	3	3.69
Stall torque $M_0$ [Nm]	5.2				7.8	
Stall current $I_0$ [A]	2.3	3.2	4.8	6.4	3.5	4.8
Maximum torque $M_{max}$ [Nm]	15.2				22.8	
Maximum current $I_{max}$ [A]	10.71	14.59	21.9	29.2	16.1	21.9
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.08	0.81	2.22	1.63
Voltage constant $K_E$ [V/1000 rpm]	134.04	98.4	64.93	49.22	134	98.4
Stator resistance $R_{2ph}$ [ $\Omega$ ]	11.53	5.94	2.64	1.42	6.24	3.6
Stator inductance $L_{2ph}$ [mH]	81.1	36.5	16.5	9.2	44.8	24
Electrical time constant $t_{el}$ [ms]	7	6.1	6.3	6.5	7.2	6.7
Thermal time constant $t_{therm}$ [min]	25				30	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	1.87				2.73	
Mass without brake $m$ [kg]	6.1				7	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxx.xx...	1045		1090		1045	1090
ACOPOS multi inverter module 8BVlxxx...	0028			0055		
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 68: 8LSC43.ee022ffgg-3, 8LSC43.ee030ffgg-3, 8LSC43.ee045ffgg-3, 8LSC43.ee060ffgg-3, 8LSC44.ee022ffgg-3, 8LSC44.ee030ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/ torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSC44. ee045ffgg-3	8LSC44. ee060ffgg-3	8LSC45. ee022ffgg-3	8LSC45. ee030ffgg-3	8LSC45. ee045ffgg-3	8LSC45. ee060ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	4500	6000	2200	3000	4500	6000
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	4.68	3.9	9.1	8.01	6.24	5.2
Nominal power $P_N$ [W]	2205	2450	2096	2516	2941	3267
Nominal current $I_N$ [A]	4.3	4.79	4.11	4.9	5.8	6.39
Stall torque $M_0$ [Nm]	7.8		10.4			
Stall current $I_0$ [A]	7.2	9.6	4.7	6.4	9.6	12.8
Maximum torque $M_{max}$ [Nm]	22.8		30.4			
Maximum current $I_{max}$ [A]	32.91	43.8	21.4	29.2	43.9	58.3
Maximum speed $n_{max}$ [rpm]	12000					
Torque constant $K_T$ [Nm/A]	1.08	0.81	2.22	1.63	1.08	0.81
Voltage constant $K_E$ [V/1000 rpm]	64.93	49.2	134	98.4	64.93	49.22
Stator resistance $R_{zph}$ [ $\Omega$ ]	1.6	0.862	4.32	2.489	1.106	0.6
Stator inductance $L_{zph}$ [mH]	10.8	6.2	41	21.8	9.69	5.4
Electrical time constant $t_{el}$ [ms]	6.8	7.2	9.5	8.8		9
Thermal time constant $t_{therm}$ [min]	30		35			
Moment of inertia $J$ [kgcm <sup>2</sup> ]	2.73		3.58			
Mass without brake $m$ [kg]	7		8.1			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	8					
Brake mass [kg]	1		0.9			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090	1180	1090		1180	
ACOPOS multi inverter module 8BVxxxx...	0110		0055		0110	
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					1.5
Connector type	speedtec					
Connector size	1.0					

Table 69: 8LSC44.ee045ffgg-3, 8LSC44.ee060ffgg-3, 8LSC45.ee022ffgg-3, 8LSC45.ee030ffgg-3, 8LSC45.ee045ffgg-3, 8LSC45.ee060ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSC46.ee022ffgg-3	8LSC46.ee030ffgg-3	8LSC46.ee045ffgg-3	8LSC46.ee060ffgg-3
<b>Motor</b>				
Nominal speed $n_N$ [rpm]	2200	3000	4500	6000
Number of pole pairs	5			
Nominal torque $M_N$ [Nm]	11.31	10.01	7.8	6.5
Nominal power $P_N$ [W]	2606	3145	3676	4084
Nominal current $I_N$ [A]	5.1	6.1	7.2	8
Stall torque $M_0$ [Nm]	13			
Stall current $I_0$ [A]	5.9	8	12	16
Maximum torque $M_{max}$ [Nm]	38			
Maximum current $I_{max}$ [A]	26.8	36.5	54.8	72.9
Maximum speed $n_{max}$ [rpm]	12000			
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.08	0.81
Voltage constant $K_E$ [V/1000 rpm]	134	98.4	64.93	49.2
Stator resistance $R_{zph}$ [ $\Omega$ ]	3.61	1.92	0.8	0.48
Stator inductance $L_{zph}$ [mH]	32	17.44	7.75	4.36
Electrical time constant $t_{el}$ [ms]	8.9	9.1	9.7	9.1
Thermal time constant $t_{therm}$ [min]	40			
Moment of inertia $J$ [kgcm <sup>2</sup> ]	4.39			
Mass without brake $m$ [kg]	8.9			
<b>Holding brake</b>				
Holding torque of the brake $M_{Br}$ [Nm]	8			
Brake mass [kg]	1			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	0.54			
<b>Recommendations</b>				
ACOPOS servo drive 8Vxxxx.xx...	1090		1180	
ACOPOS multi inverter module 8BVlxxxx...	0055	0110		0220
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75		1.5	
Connector type	speedtec			
Connector size	1.0			

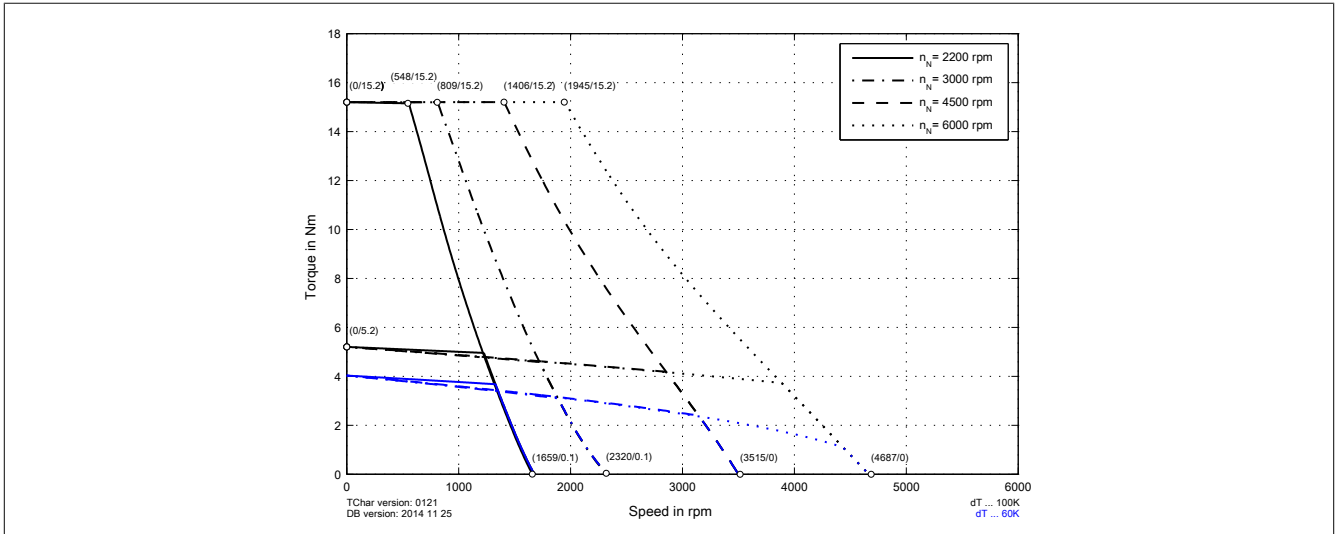
Table 70: 8LSC46.ee022ffgg-3, 8LSC46.ee030ffgg-3, 8LSC46.ee045ffgg-3, 8LSC46.ee060ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

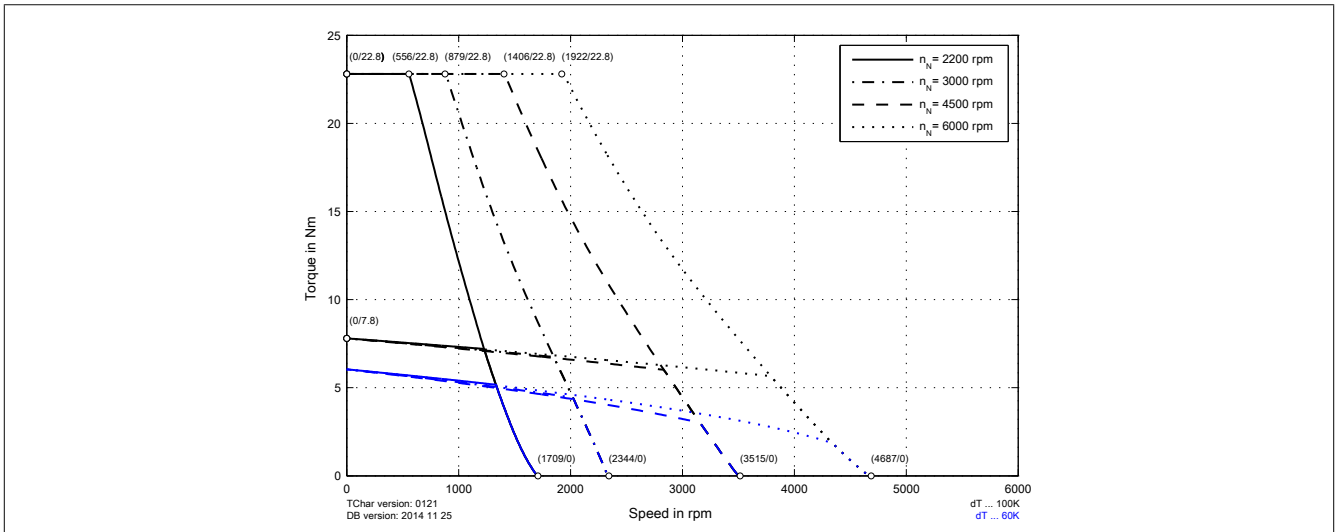
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

### 2.8.1.1 Speed-torque characteristics at DC bus voltage of 325 VDC

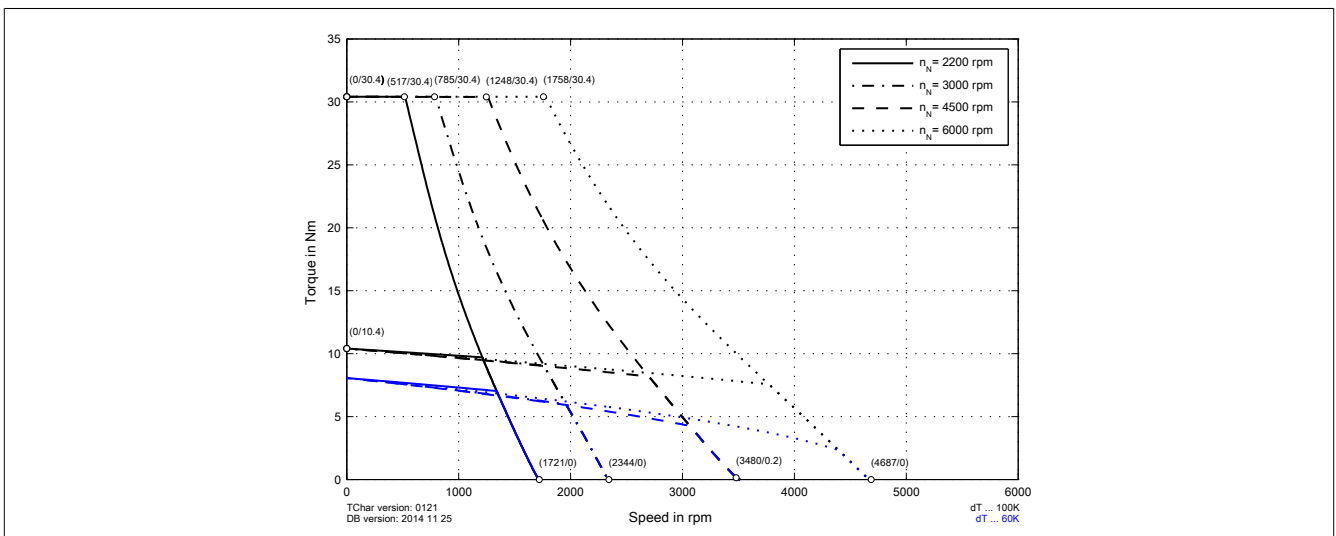
#### 8LSC43.eennffgg-3



#### 8LSC44.eennffgg-3

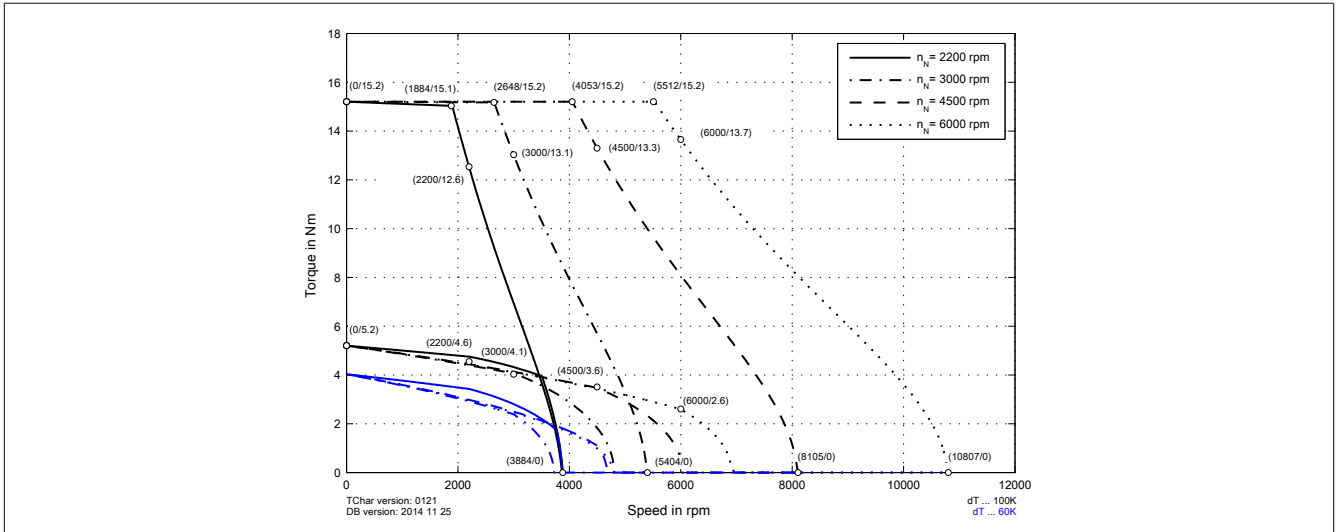


#### 8LSC45.eennffgg-3

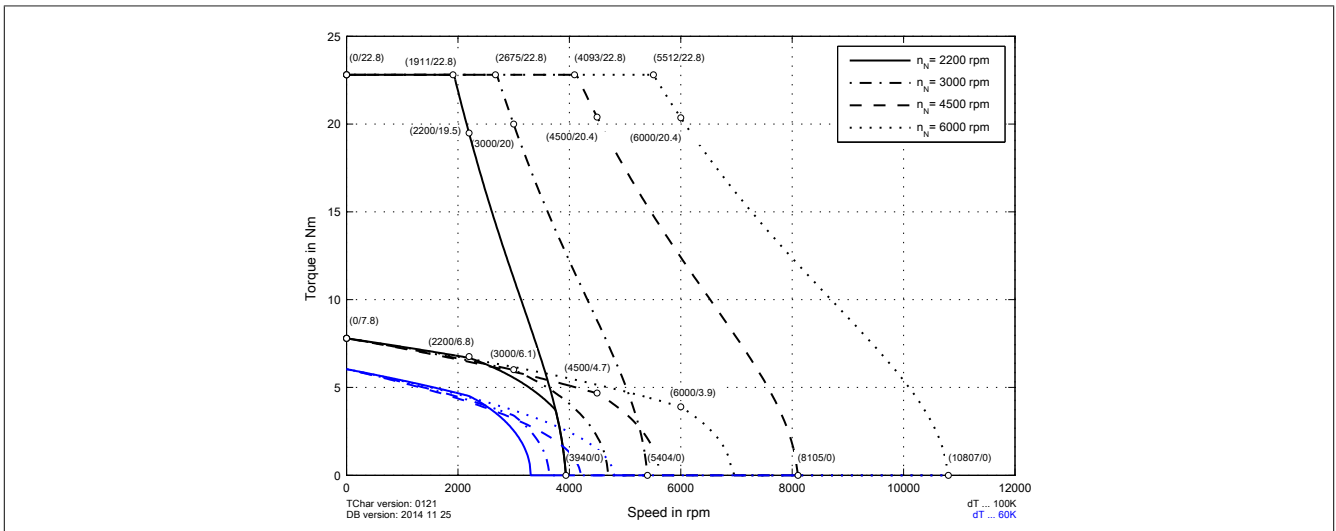


### 2.8.1.2 Speed-torque characteristics at DC bus voltage of 750 VDC

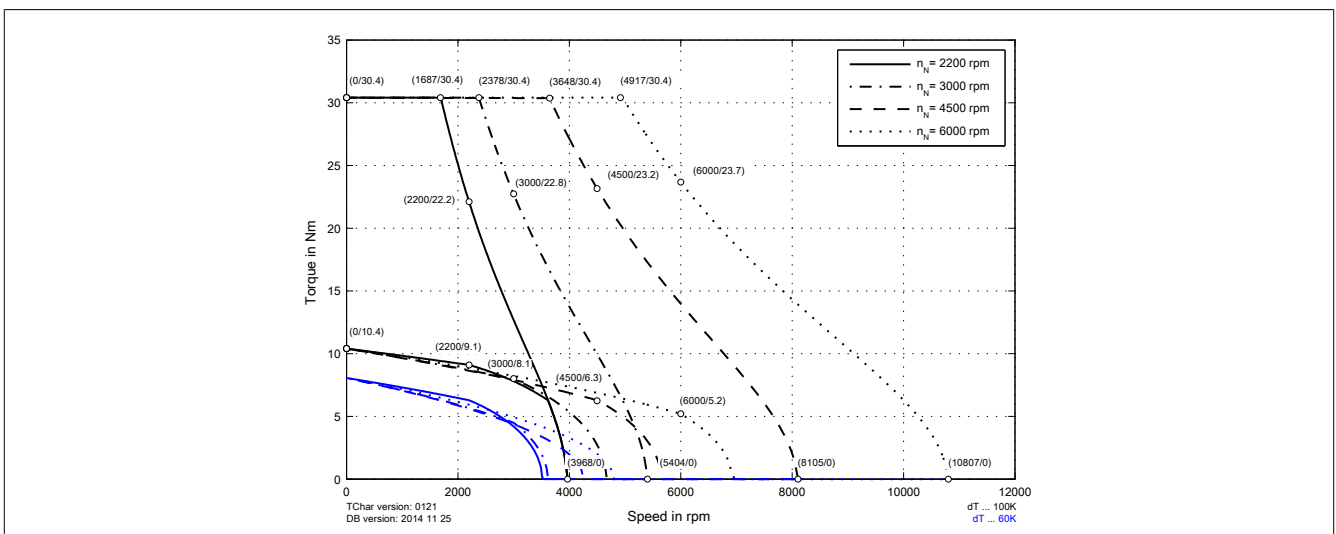
#### 8LSC43.eennffgg-3



#### 8LSC44.eennffgg-3

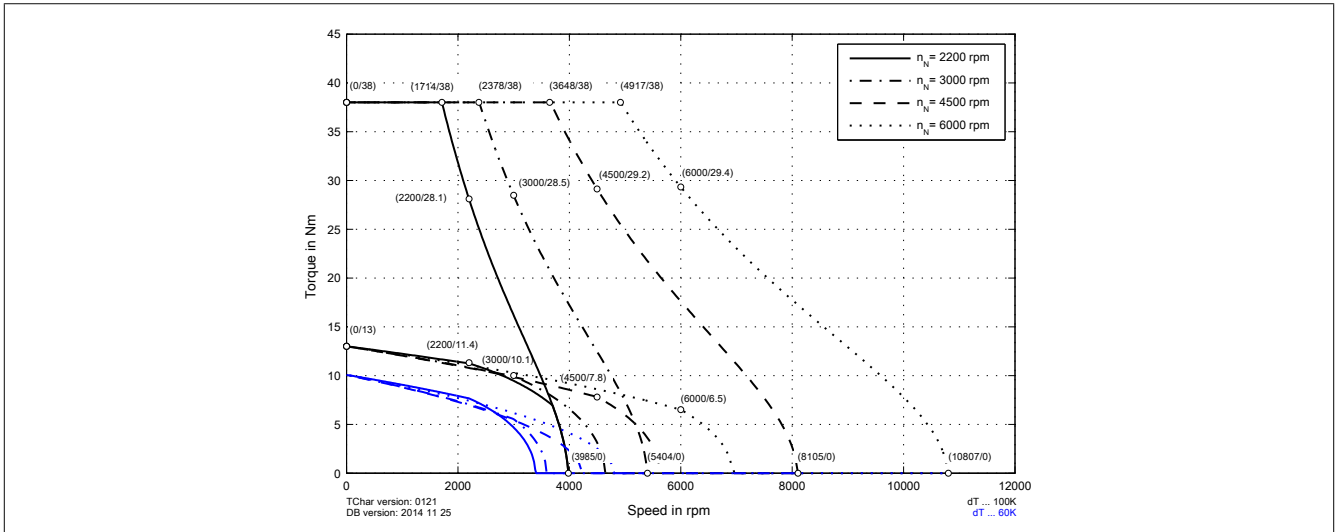


#### 8LSC45.eennffgg-3



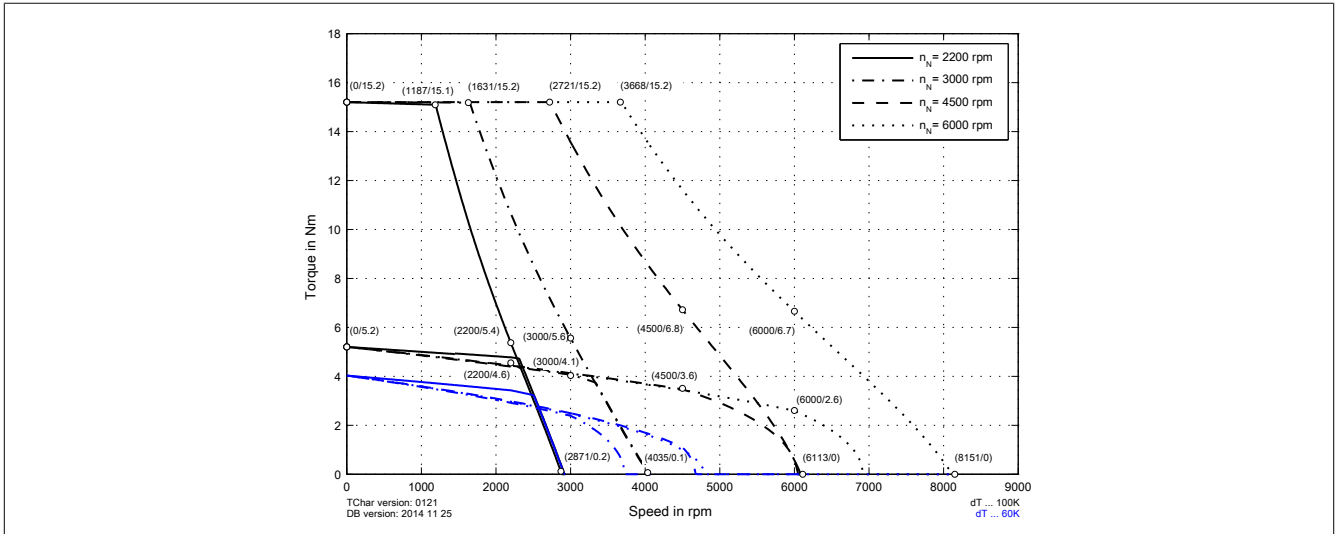


8LSC46.eennffgg-3

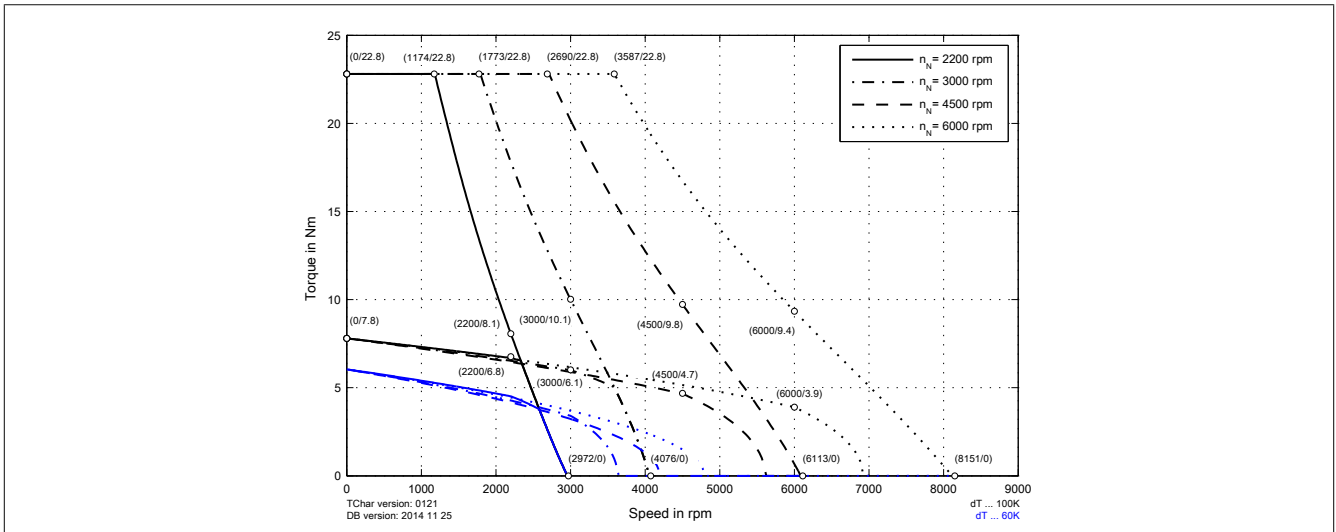


### 2.8.1.3 Speed-torque characteristics at DC bus voltage of 560 VDC

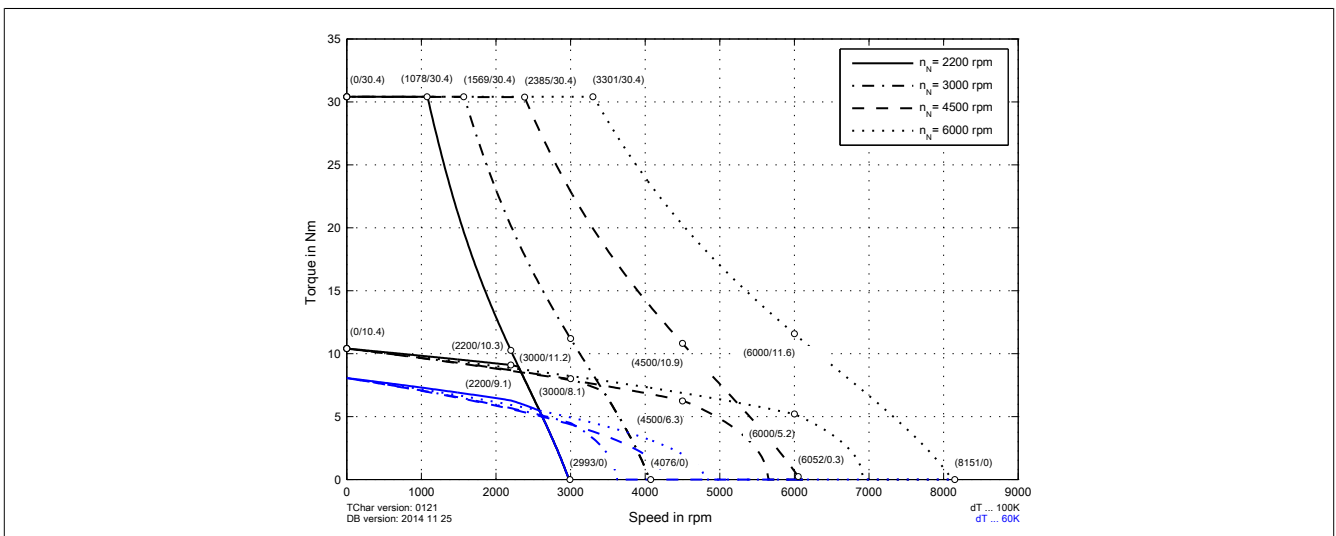
#### 8LSC43.eennffgg-3



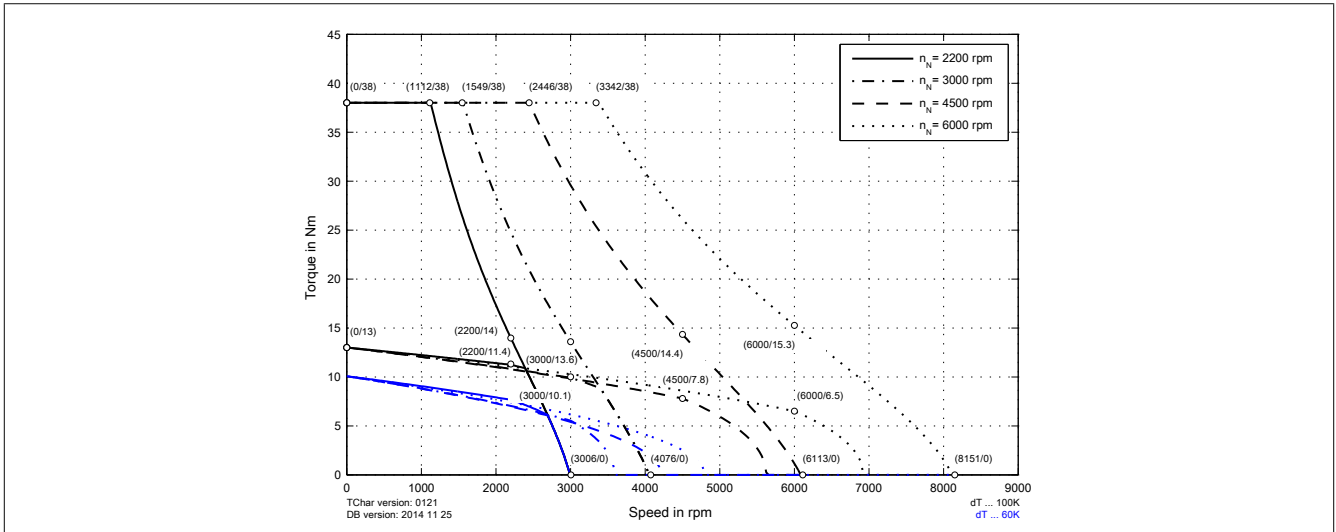
#### 8LSC44.eennffgg-3



#### 8LSC45.eennffgg-3



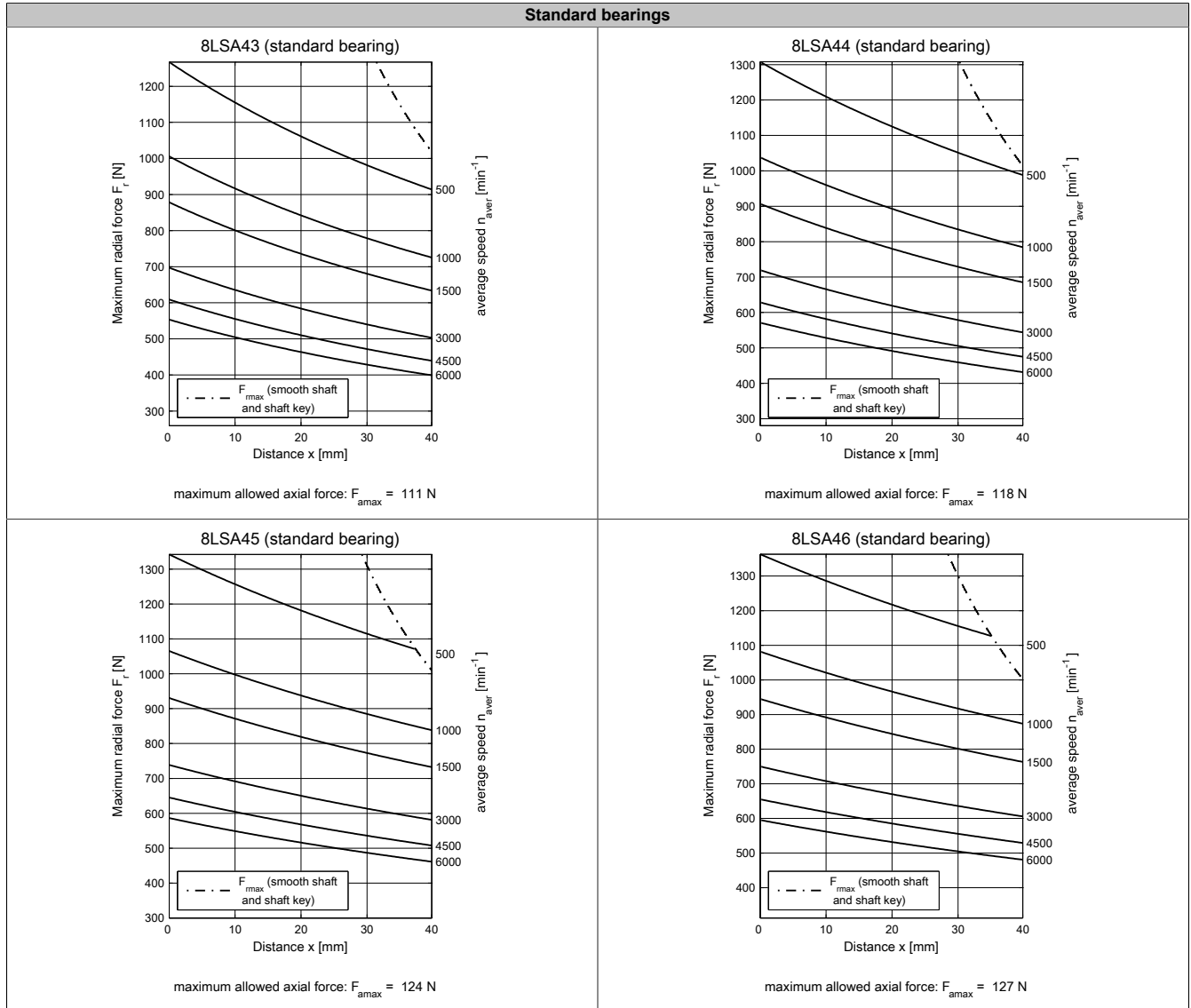
8LSC46.eennffgg-3



### 2.8.1.4 Permissible shaft load

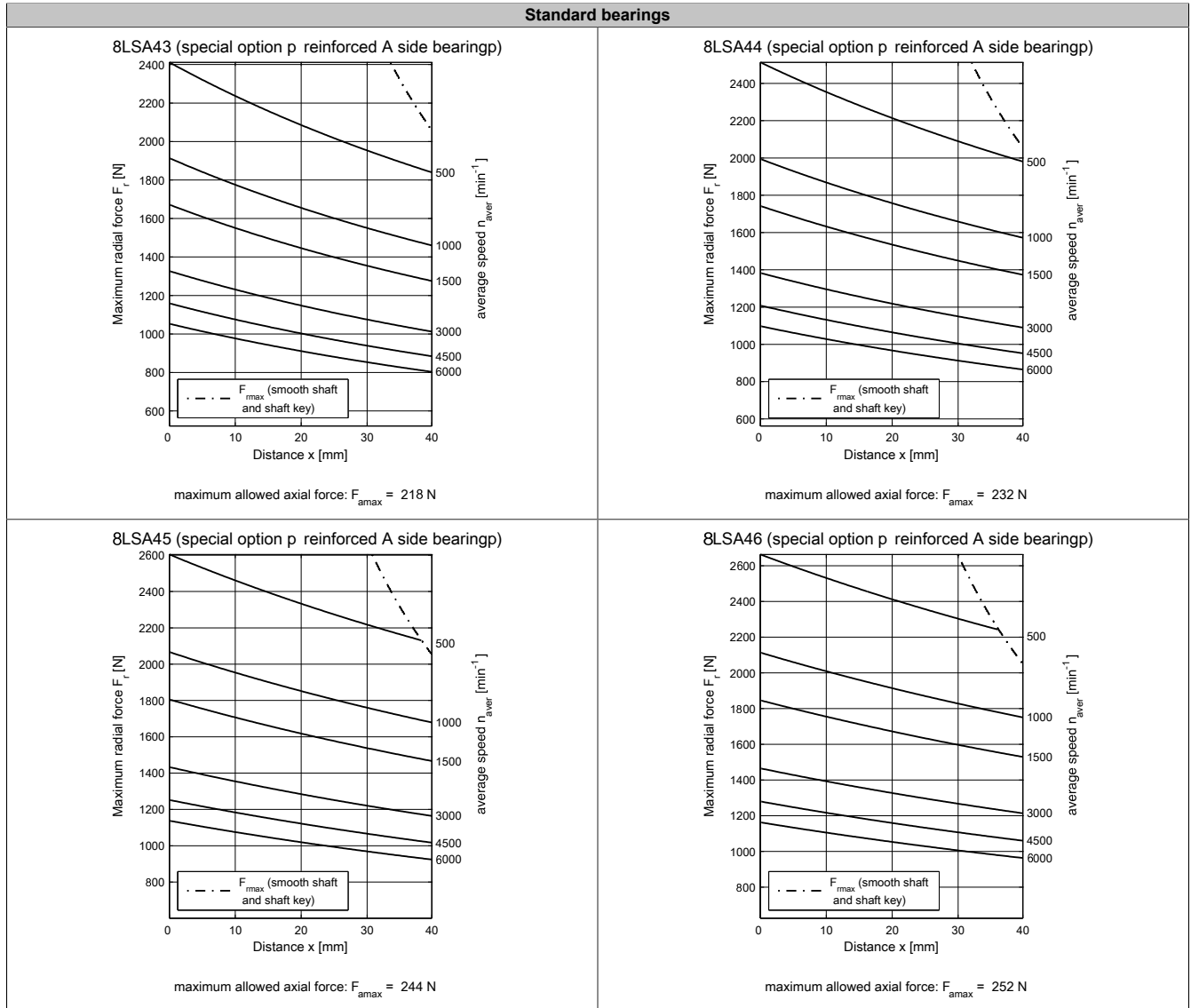
#### 2.8.1.4.1 8LSA/C4 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!

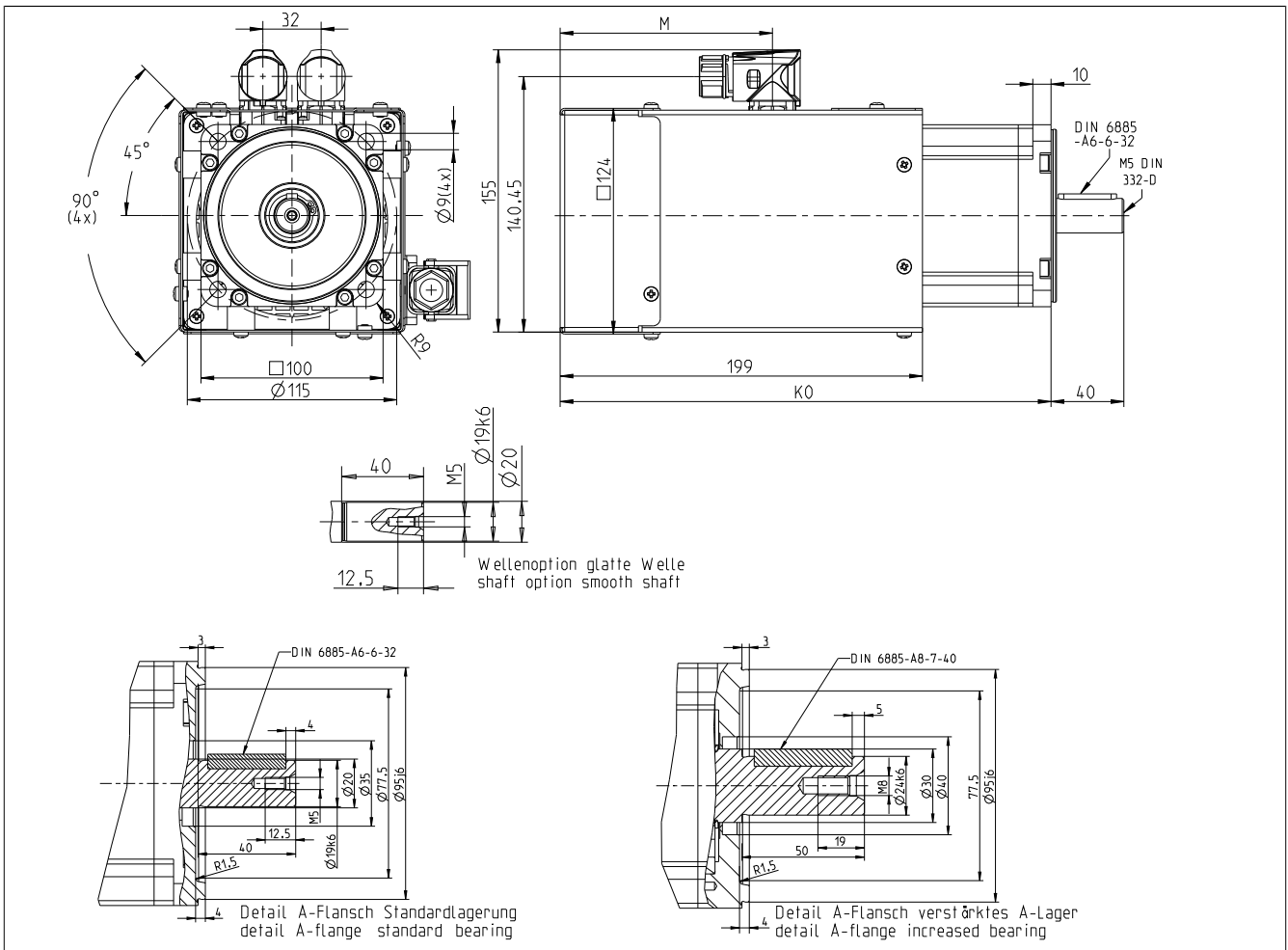


2.8.1.4.2 8LSA/C4 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!



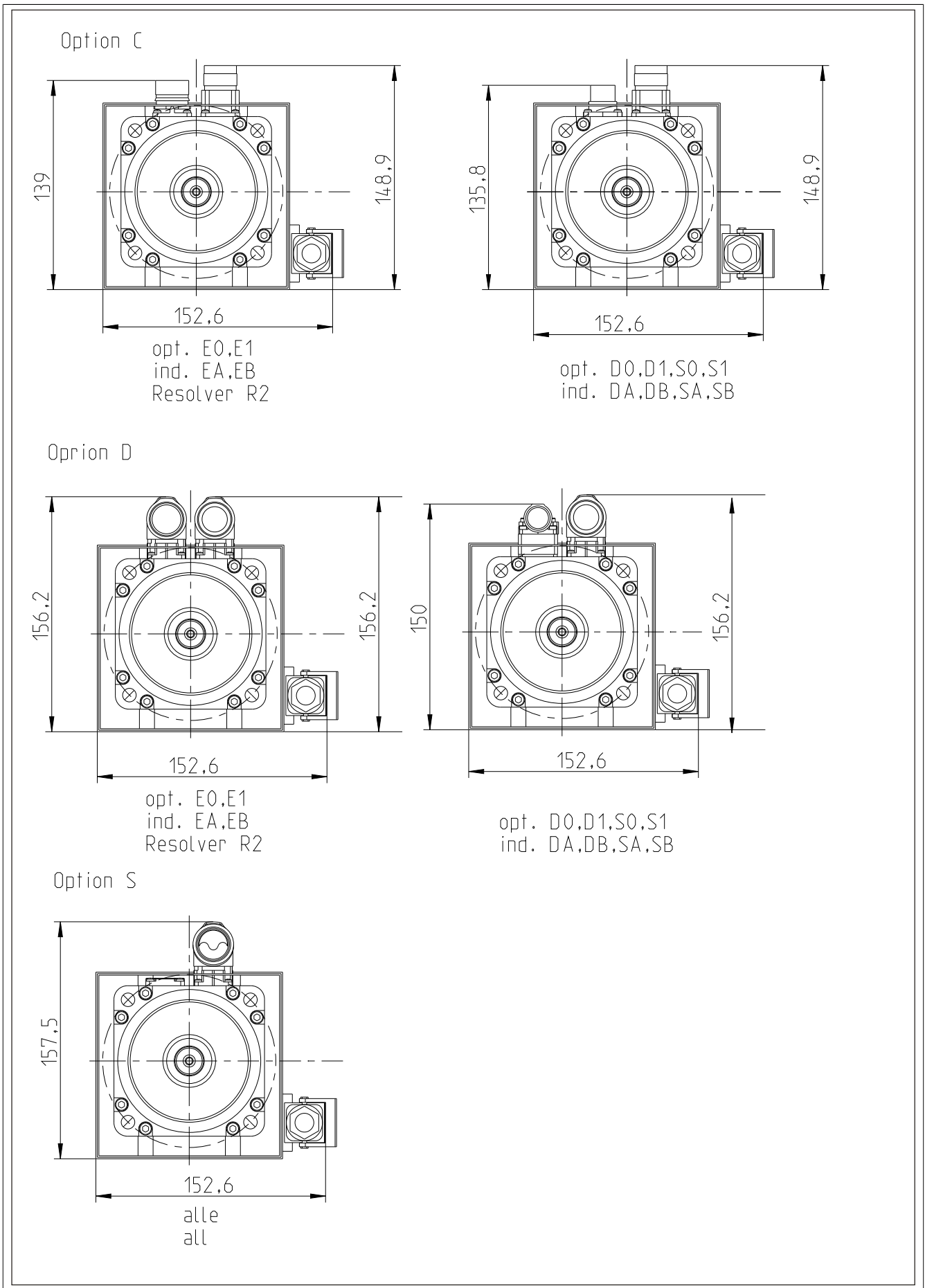
2.8.1.5 8LSC4 V3 - Dimensions



EnDat / resolver feedback Model number	K	M	Extension of $K_0$ , $K_1$ and M depending on the motor option [mm]		
			Holding brake	Heavy duty holding brake	Reinforced A side bearing
8LSC43.eennffgg-3	250	117	32	37	15
8LSC44.eennffgg-3	270	117	32	37	15
8LSC45.eennffgg-3	294	117	32	37	15
8LSC46.eennffgg-3	314	117	32	37	15

Whether or not an oil seal is used has no effect on the length of the motor.

2.8.1.5.1 8LSC4 V3 - Connector options - Dimensions



## 2.8.2 Technical data - 8LSC5 V3

Model number	8LSC53. ee022ffgg-3	8LSC53. ee030ffgg-3	8LSC53. ee045ffgg-3	8LSC54. ee022ffgg-3	8LSC54. ee030ffgg-3	8LSC54. ee045ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2200	3000	4500	2200	3000	4500
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	5.46	5.2	5.07	10.14	10.01	9.49
Nominal power $P_N$ [W]	1258	1634	2389	2336	3145	4472
Nominal current $I_N$ [A]	2.5	3.19	4.6		6.1	8.7
Stall torque $M_0$ [Nm]	5.85		11.7			
Stall current $I_0$ [A]	2.6	3.6	5.4	5.3	7.2	10.7
Maximum torque $M_{max}$ [Nm]	13.8			27.6		
Maximum current $I_{max}$ [A]	8	10.5	16.5	15.39	20.9	33
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant $K_E$ [V/1000 rpm]	134	98.4	66	134	98.4	66
Stator resistance $R_{zph}$ [ $\Omega$ ]	10.9	5.13	2.222	3.44	2.16	0.926
Stator inductance $L_{zph}$ [mH]	95.92	40.33	19.33	34.5	21.52	8.67
Electrical time constant $t_{el}$ [ms]	8.8	7.9	8.7	10	10.6	10.9
Thermal time constant $t_{therm}$ [min]	33			37		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	3.62			6.04		
Mass without brake $m$ [kg]	8.5			10.8		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15					
Brake mass [kg]	1.49			1.43		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1045		1090			1180
ACOPOS multi inverter module 8BVlxxxx...	0028	0055			0110	
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75					
Connector type	speedtec					
Connector size	1.0					

Table 71: 8LSC53.ee022ffgg-3, 8LSC53.ee030ffgg-3, 8LSC53.ee045ffgg-3, 8LSC54.ee022ffgg-3, 8LSC54.ee030ffgg-3, 8LSC54.ee045ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.



Model number	8LSC55. ee022ffgg-3	8LSC55. ee030ffgg-3	8LSC55. ee045ffgg-3	8LSC56. ee022ffgg-3	8LSC56. ee030ffgg-3	8LSC56. ee045ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2200	3000	4500	2200	3000	4500
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	15.34	15.08	12.35	18.72	18.07	16.51
Nominal power $P_N$ [W]	3534	4738	5820	4313	5677	7780
Nominal current $I_N$ [A]	6.9	9.3	11.3	8.4	11.1	15.1
Stall torque $M_0$ [Nm]	16.25			20.8		
Stall current $I_0$ [A]	7.3	10	14.9	9.4	12.8	19.1
Maximum torque $M_{max}$ [Nm]	41.4			55.2		
Maximum current $I_{max}$ [A]	23.6	33	47.29	30.8	41.8	65.9
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant $K_E$ [V/1000 rpm]	134	98.4	66	134	98.4	66
Stator resistance $R_{zph}$ [ $\Omega$ ]	2.265	1.127	0.51	1.51	0.75	0.341
Stator inductance $L_{zph}$ [mH]	24.29	12.5	4.96	17.6	8.16	4.08
Electrical time constant $t_{el}$ [ms]	10.7	11.1	9.7	11.6	10.9	12
Thermal time constant $t_{therm}$ [min]	40			43		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	8.19			10.66		
Mass without brake $m$ [kg]	12.7			15.3		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	15					
Brake mass [kg]	1.47			1.44		
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	1.66					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090	1180			1320	
ACOPOS multi inverter module 8BVxxxx...	0110		0220	0110		0220
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75		1.5	0.75	1.5	4
Connector type	speedtec					
Connector size	1.0					

Table 72: 8LSC55.ee022ffgg-3, 8LSC55.ee030ffgg-3, 8LSC55.ee045ffgg-3, 8LSC56.ee022ffgg-3, 8LSC56.ee030ffgg-3, 8LSC56.ee045ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSC57.ee022ffgg-3	8LSC57.ee030ffgg-3	8LSC57.ee045ffgg-3
<b>Motor</b>			
Nominal speed $n_N$ [rpm]	2200	3000	4500
Number of pole pairs		4	
Nominal torque $M_N$ [Nm]	23.4	22.75	19.5
Nominal power $P_N$ [W]	5391	7147	9189
Nominal current $I_N$ [A]	10.6	14	17.9
Stall torque $M_0$ [Nm]		26	
Stall current $I_0$ [A]	11.7	16	23.8
Maximum torque $M_{max}$ [Nm]		69	
Maximum current $I_{max}$ [A]	38.39	52.6	82.61
Maximum speed $n_{max}$ [rpm]		9000	
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.09
Voltage constant $K_E$ [V/1000 rpm]	134	98.4	66
Stator resistance $R_{zph}$ [ $\Omega$ ]	1.13	0.62	0.29
Stator inductance $L_{zph}$ [mH]	13.17	7.21	3.2
Electrical time constant $t_{el}$ [ms]	11.7	11.6	11
Thermal time constant $t_{therm}$ [min]		46	
Moment of inertia $J$ [kgcm <sup>2</sup> ]		13.13	
Mass without brake $m$ [kg]		16.8	
<b>Holding brake</b>			
Holding torque of the brake $M_{Br}$ [Nm]		15	
Brake mass [kg]		1.3	
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]		1.66	
<b>Recommendations</b>			
ACOPOS servo drive 8Vxxxx.xx...		1180	1320
ACOPOS multi inverter module 8BVIxxxx...	0110	0220	0330
Cross section for B&R motor cables [mm <sup>2</sup> ]		1.5	4
Connector type		speedtec	
Connector size		1.0	

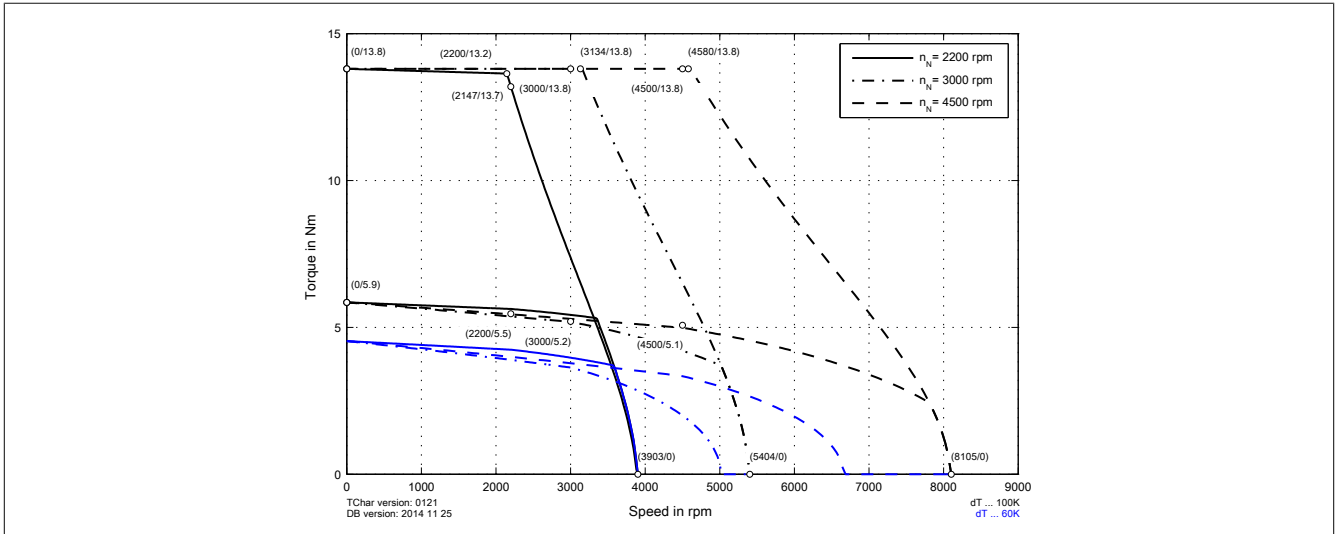
Table 73: 8LSC57.ee022ffgg-3, 8LSC57.ee030ffgg-3, 8LSC57.ee045ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

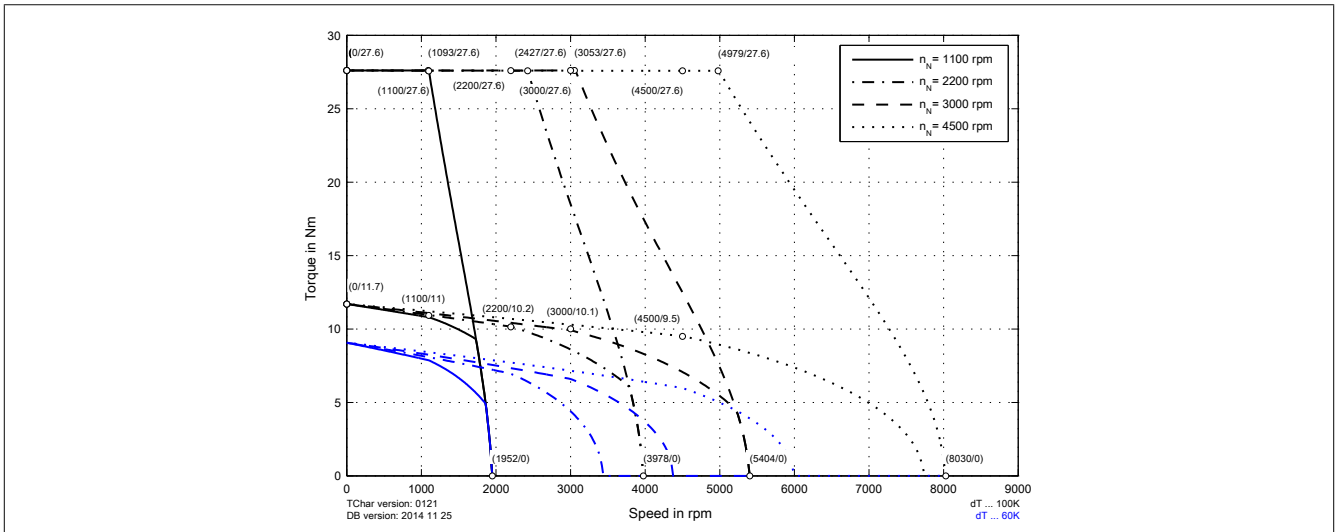
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

2.8.2.1 Speed-torque characteristics at DC bus voltage of 750 VDC

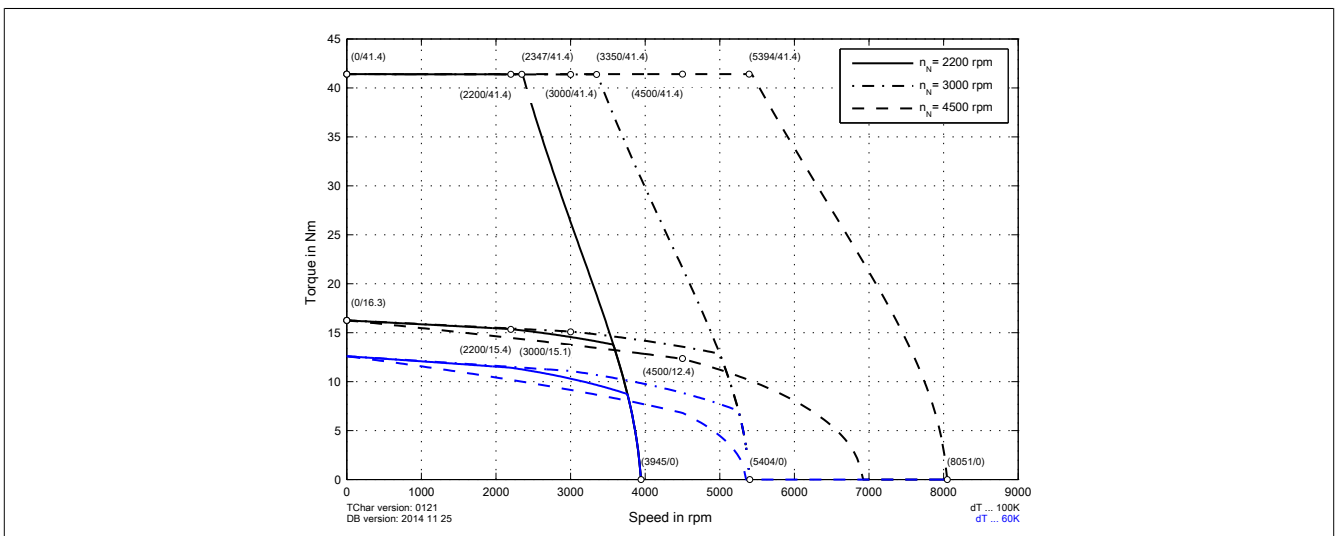
8LSC53.eennffgg-3



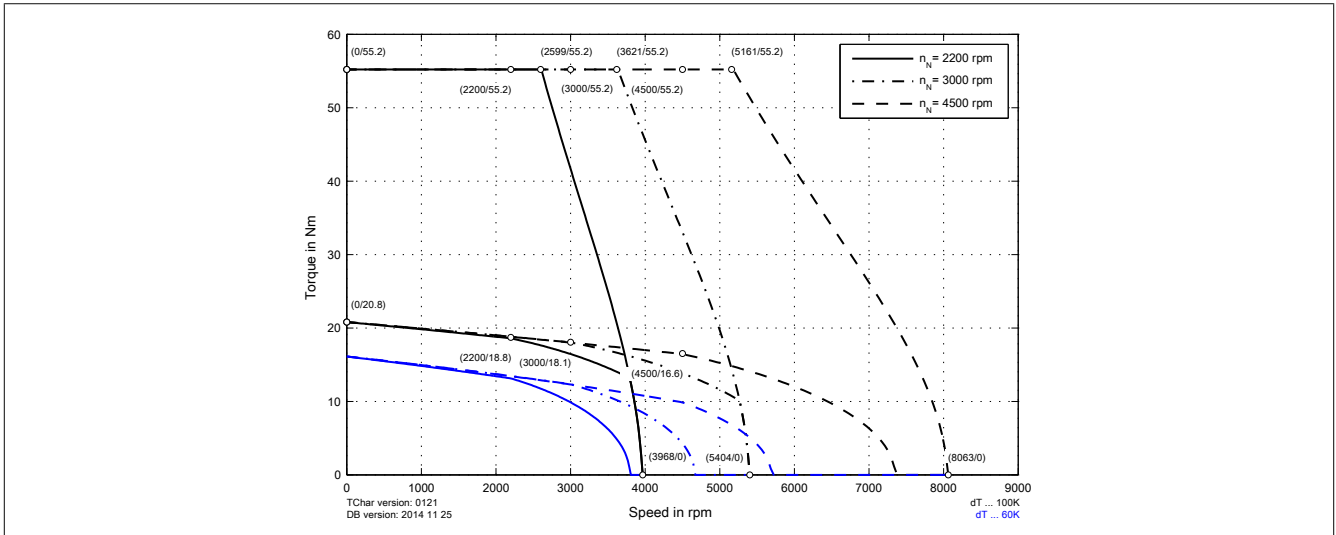
8LSC54.eennffgg-3



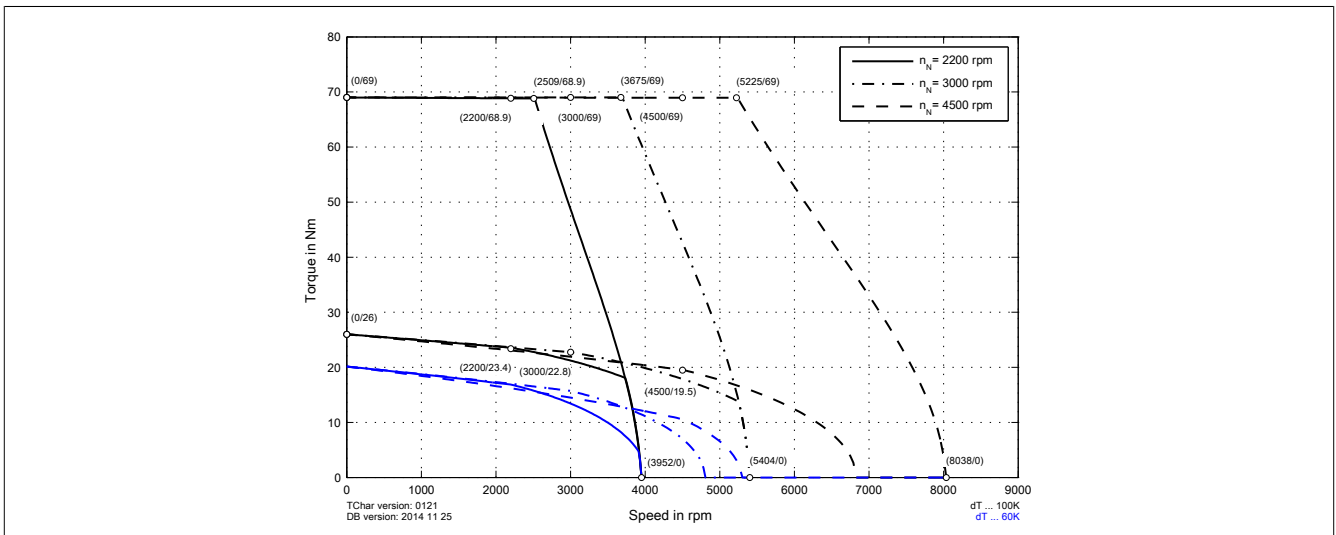
8LSC55.eennffgg-3



8LSC56.eennffgg-3

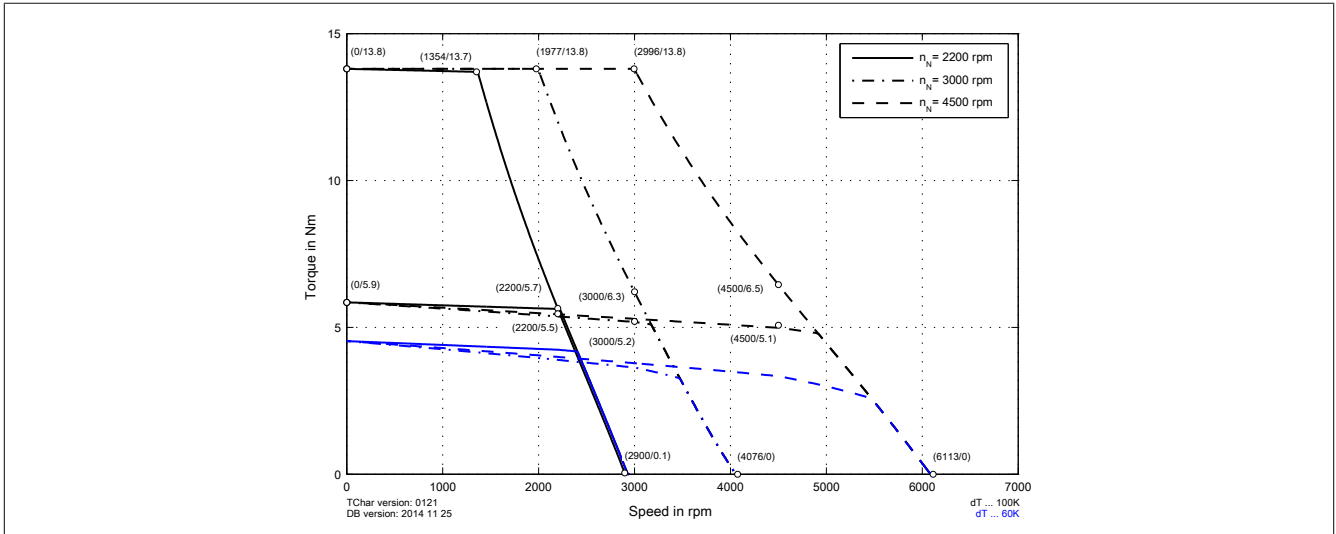


8LSC57.eennffgg-3

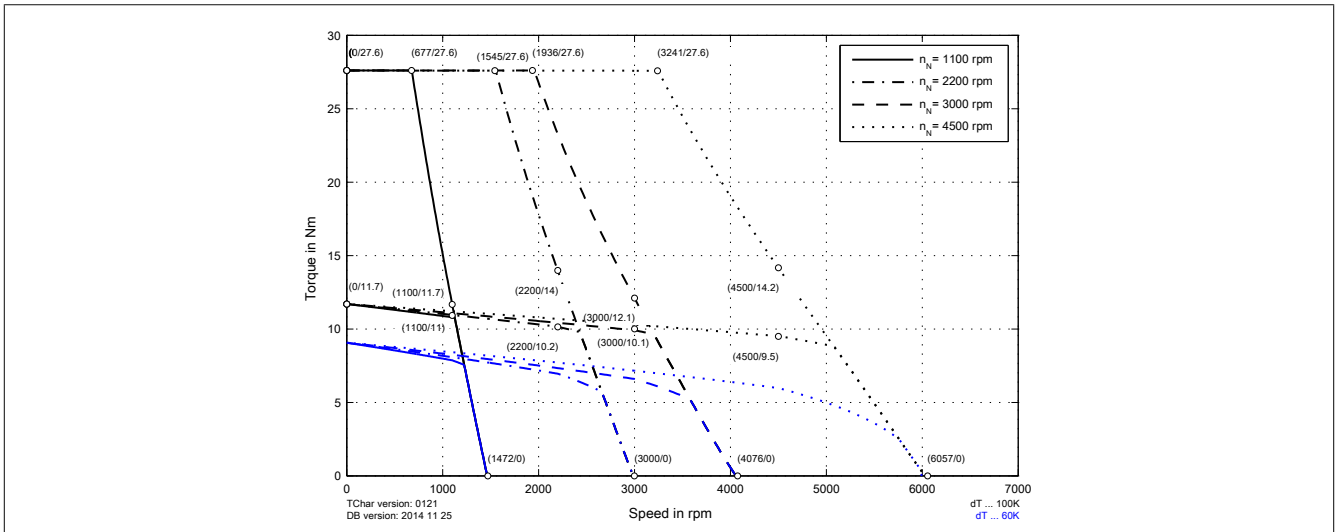


2.8.2.2 Speed-torque characteristics at DC bus voltage of 560 VDC

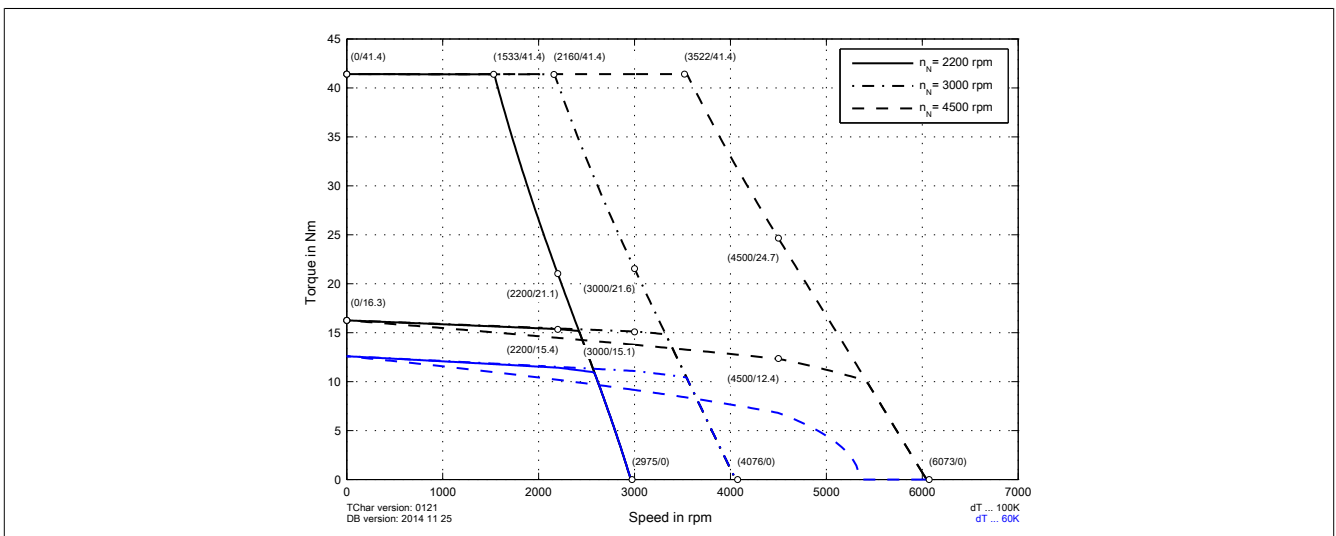
8LSC53.eennffgg-3



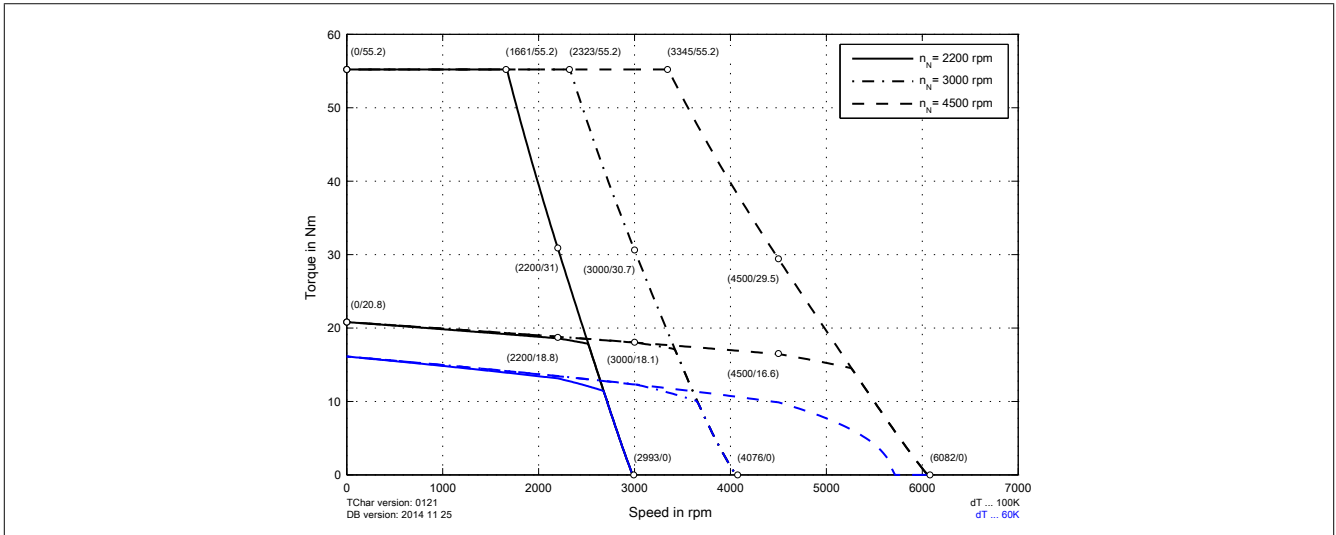
8LSC54.eennffgg-3



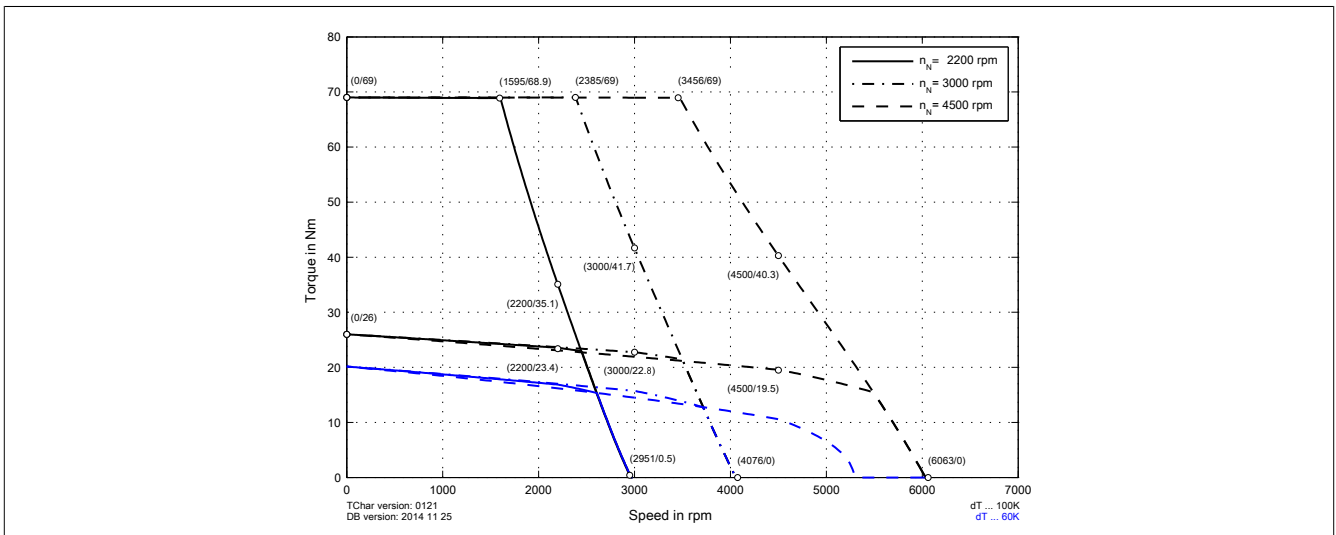
8LSC55.eennffgg-3



8LSC56.eennffgg-3

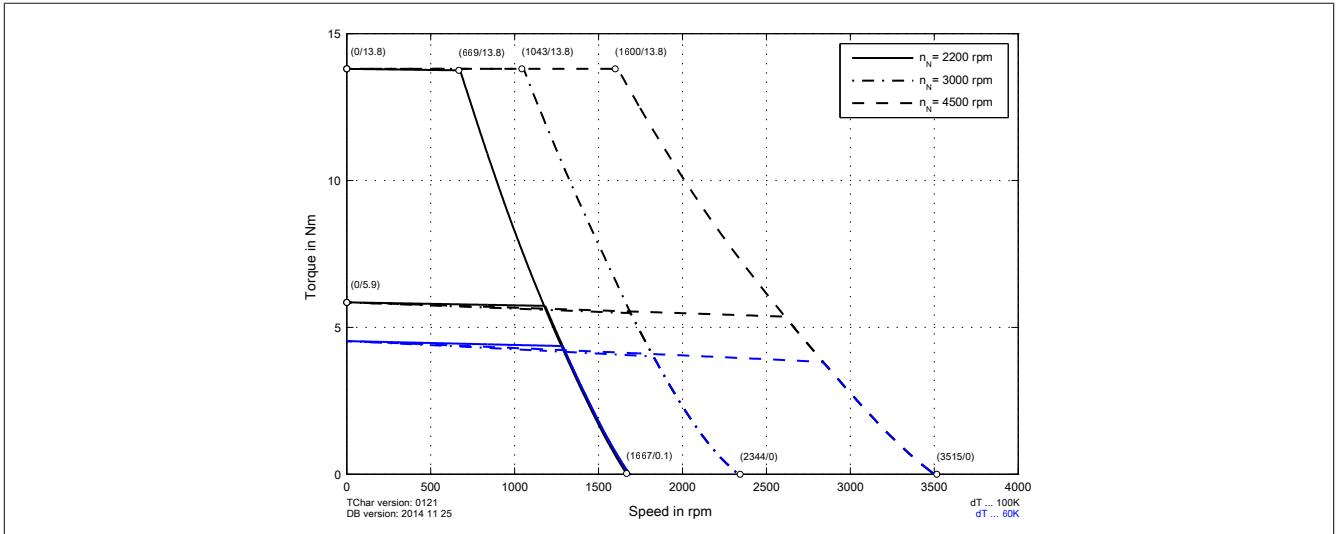


8LSC57.eennffgg-3

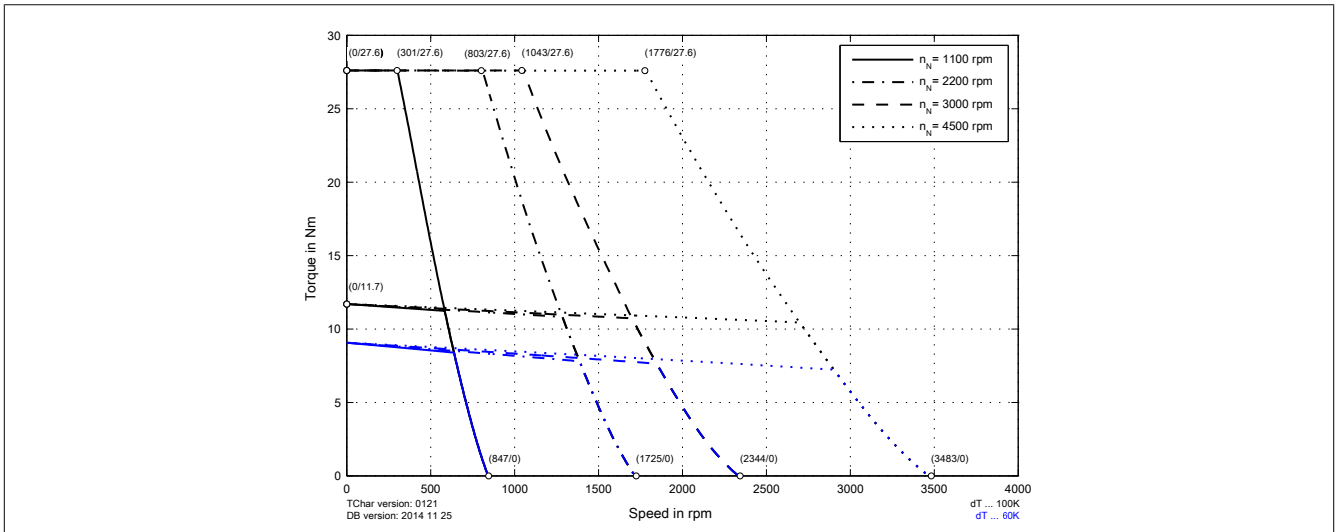


### 2.8.2.3 Speed-torque characteristics at DC bus voltage of 325 VDC

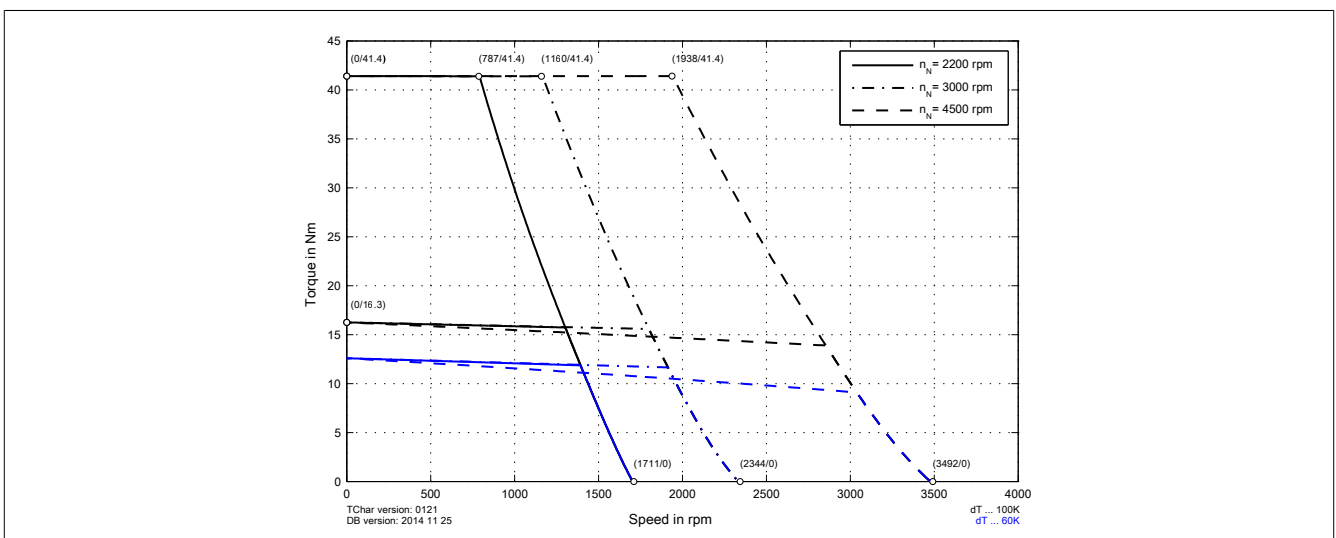
#### 8LSC53.eennffgg-3



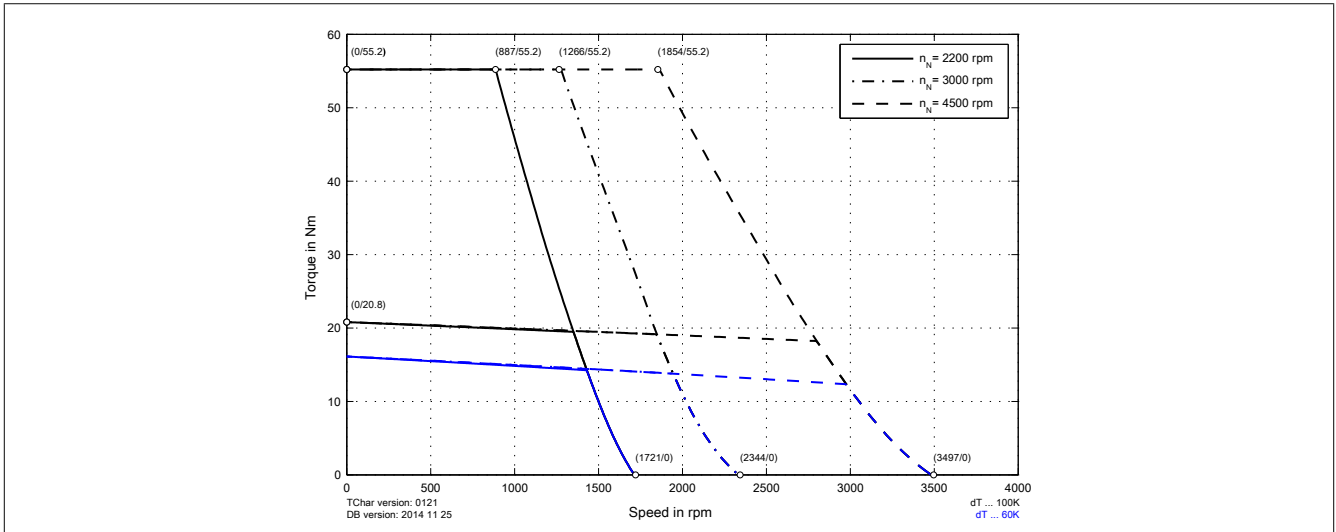
#### 8LSC54.eennffgg-3



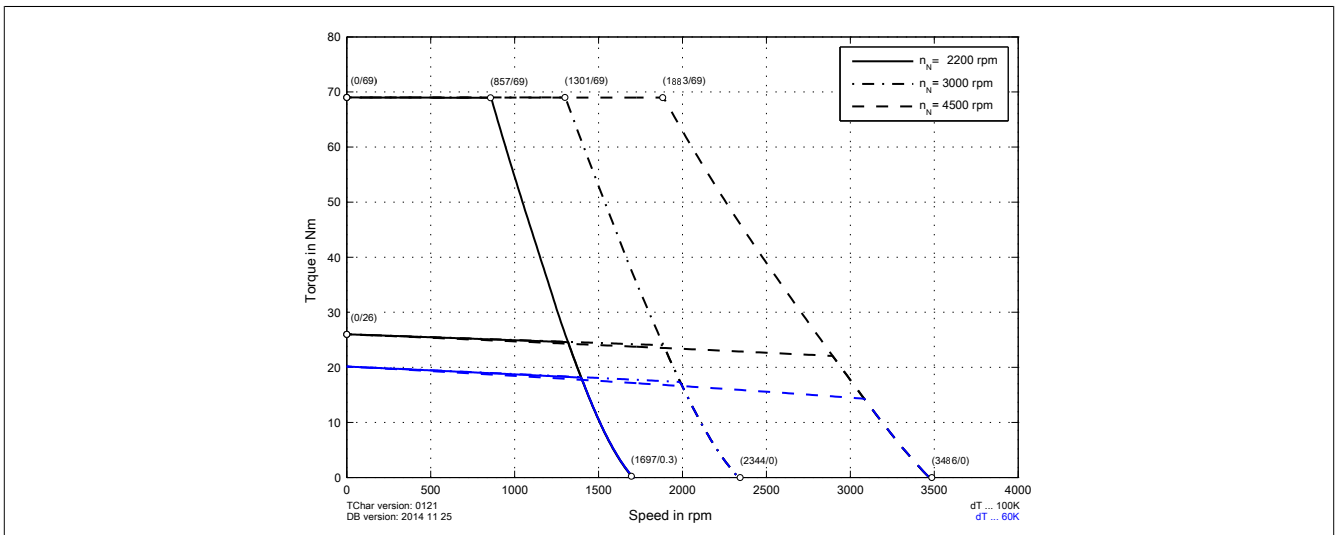
#### 8LSC55.eennffgg-3



8LSC56.eennffgg-3



8LSC57.eennffgg-3

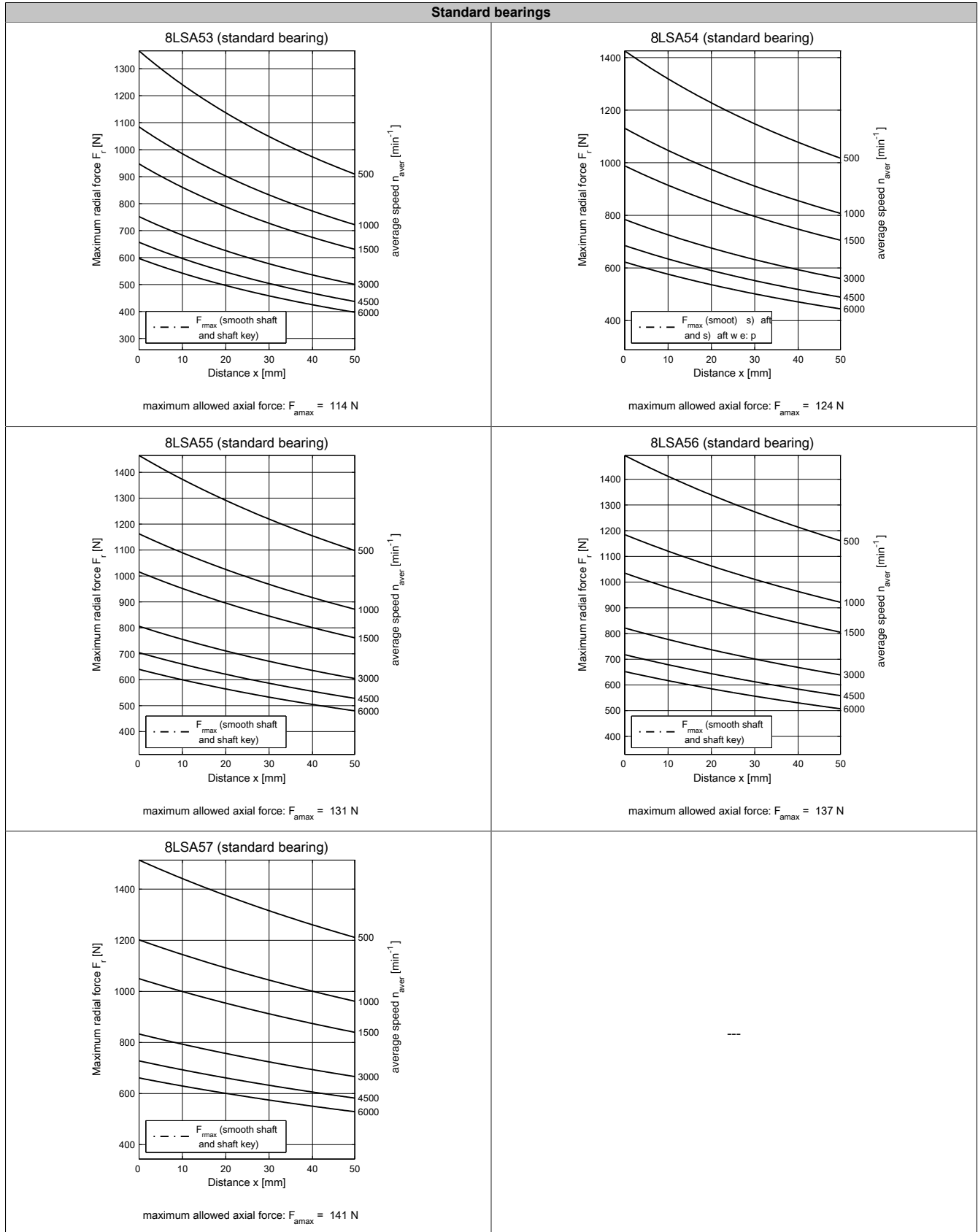




### 2.8.2.4 Permissible shaft load

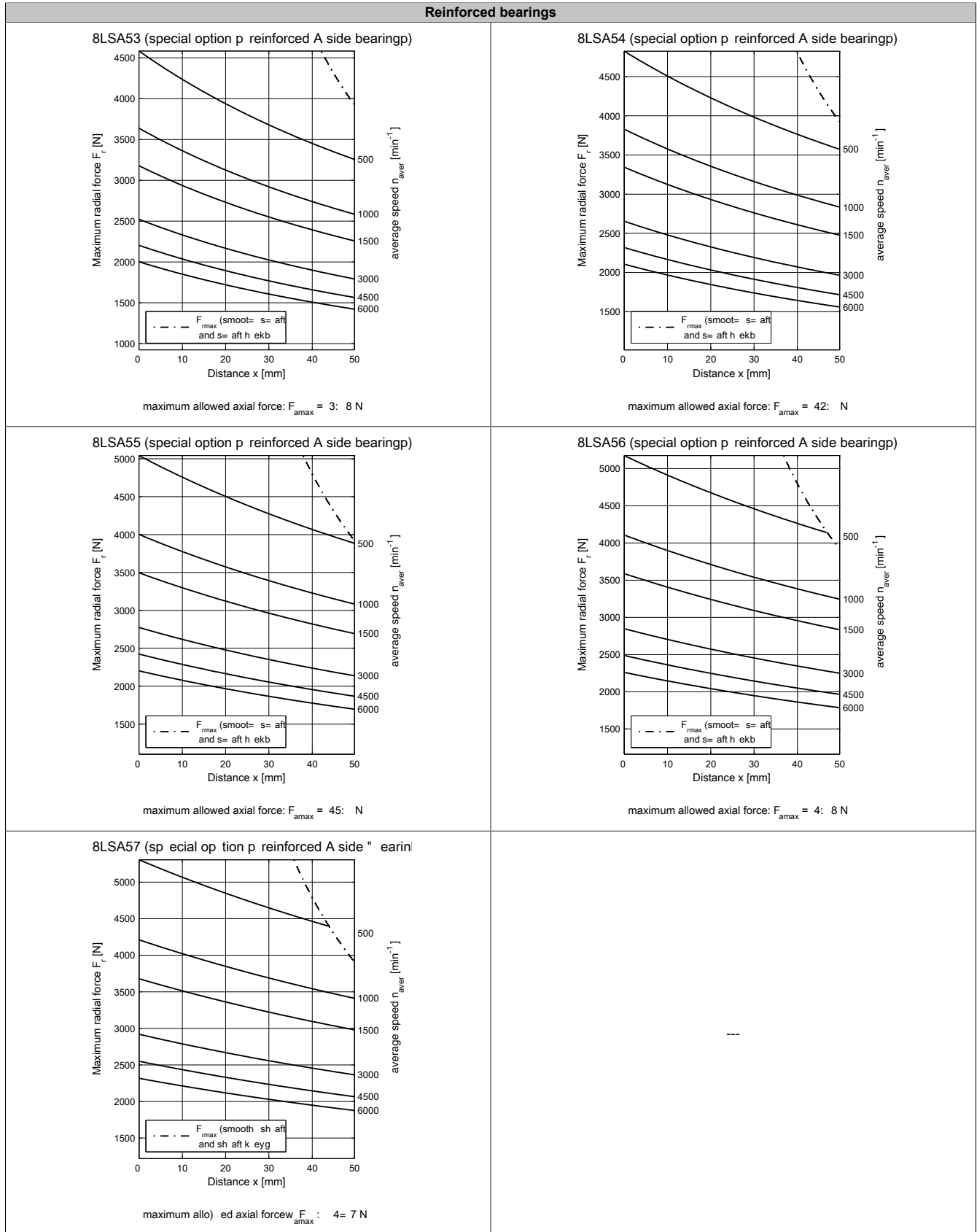
#### 2.8.2.4.1 8LSA/C5 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!

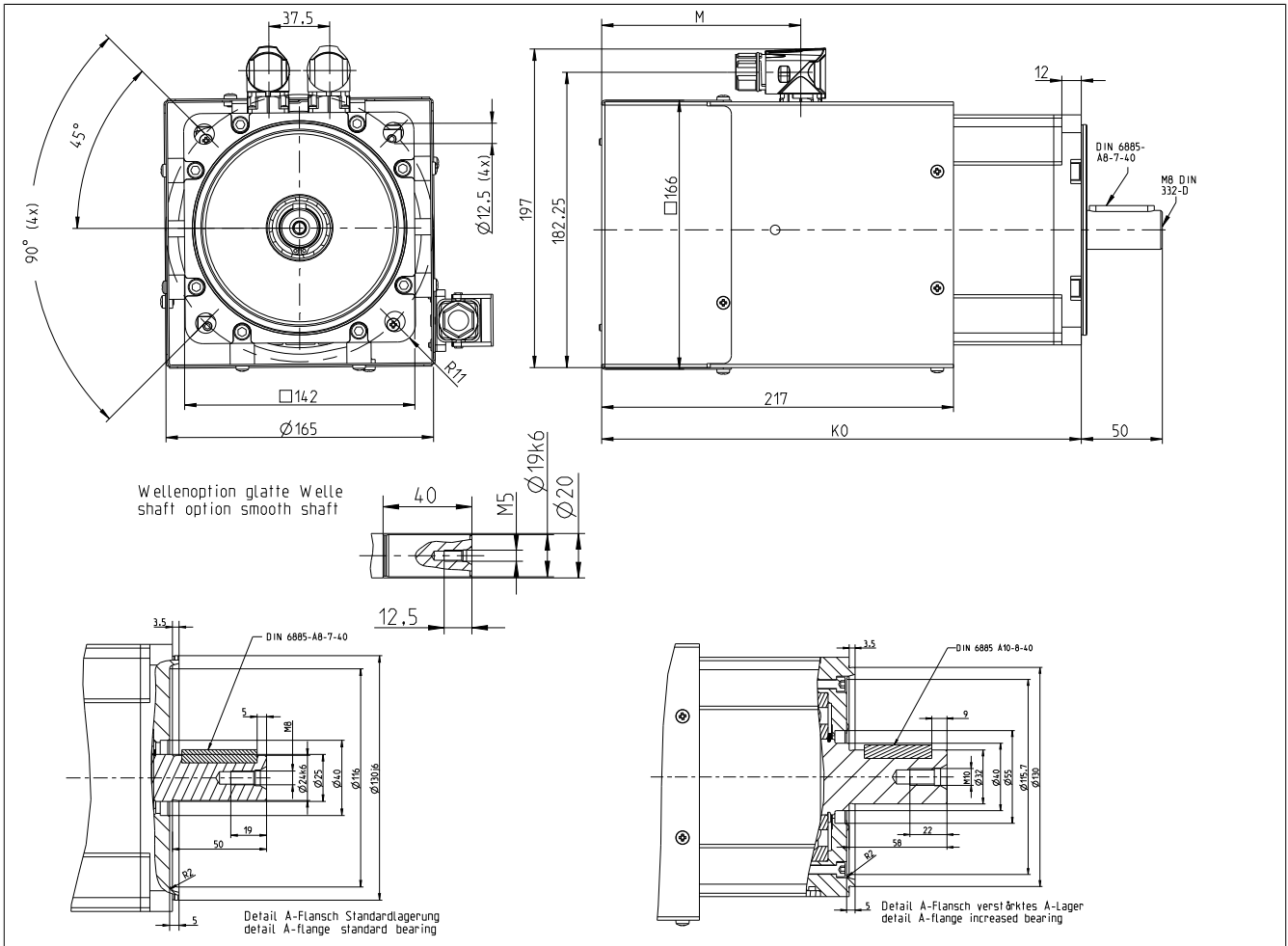


2.8.2.4.2 8LSA/C5 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!



2.8.2.5 8LSC5 Version 3 - Dimensions

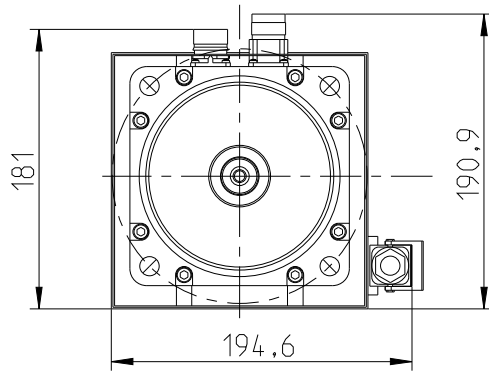


EnDat / resolver feedback	Extension of K <sub>0</sub> and M depending on the motor option [mm]				
	Model number	K <sub>0</sub>	M	Holding brake	Heavy duty holding brake
8LSC53.eennnffgg-3	246	123	35	50	15
8LSC54.eennnffgg-3	271	123	35	50	10
8LSC55.eennnffgg-3	296	123	30	45	10
8LSC56.eennnffgg-3	321	123	30	45	5
8LSC57.eennnffgg-3	346	123	25	40	5

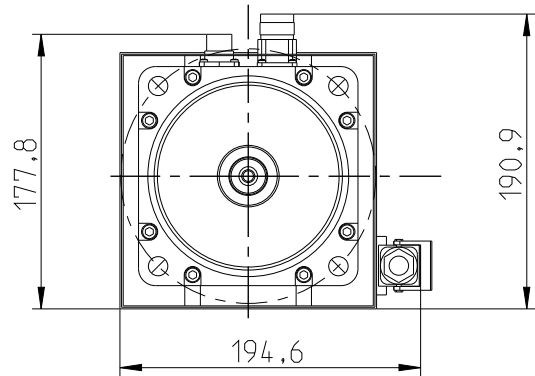
Whether or not an oil seal is used has no effect on the length of the motor.

2.8.2.5.1 8LSC5 V3 - Connector options - Dimensions

Option C

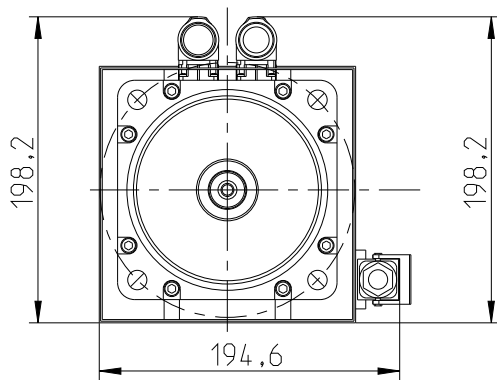


opt. E0,E1  
ind. EA,EB  
Resolver R2

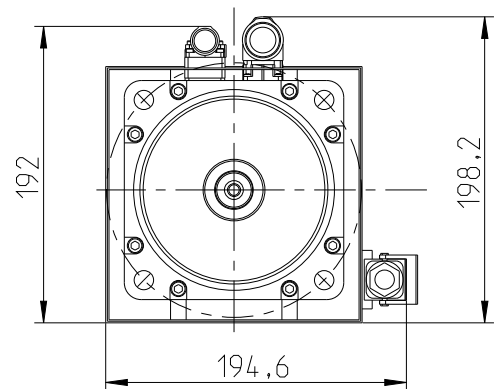


opt. D0,D1,S0,S1  
ind. DA,DB,SA,SB

Option D

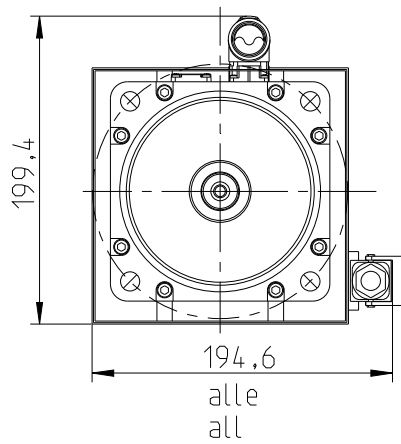


opt. E0,E1  
ind. EA,EB  
Resolver R2



opt. D0,D1,S0,S1  
ind. DA,DB,SA,SB

Option S



## 2.8.3 Technical data - 8LSC6 V3

Model number	8LSC63. ee022ffgg-3	8LSC63. ee030ffgg-3	8LSC63. ee045ffgg-3	8LSC64. ee022ffgg-3	8LSC64. ee030ffgg-3	8LSC64. ee045ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2200	3000	4500	2200	3000	4500
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	15.34	15.08	12.35	23.4	22.75	19.63
Nominal power $P_N$ [W]	3534	4738	5820	5391	7147	9250
Nominal current $I_N$ [A]	6.9	9.3	11.3	10.6	14	17.99
Stall torque $M_0$ [Nm]	16.25			26		
Stall current $I_0$ [A]	7.3	10	14.9	11.7	16	23.8
Maximum torque $M_{max}$ [Nm]	46.92			78.2		
Maximum current $I_{max}$ [A]	30.5	42.5	61	49.5	67.8	106.5
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant $K_E$ [V/1000 rpm]	134	98.4	66	134	98.4	66
Stator resistance $R_{zph}$ [ $\Omega$ ]	2.265	1.127	0.51	1.13	0.62	0.285
Stator inductance $L_{zph}$ [mH]	24.29	12.5	5	13.17	7.21	3.21
Electrical time constant $t_{el}$ [ms]	10.7	11.1	9.7	11.7	11.6	11.03
Thermal time constant $t_{therm}$ [min]	42			45		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	8.19			13.13		
Mass without brake $m$ [kg]	15.1			19		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	32					
Brake mass [kg]	1.6					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	5.85					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1090	1180			1320	
ACOPOS multi inverter module 8BVxxxx...	0110		0220	0110	0220	0330
Cross section for B&R motor cables [mm <sup>2</sup> ]	0.75		1.5			4
Connector type	speedtec					
Connector size	1.0					

Table 74: 8LSC63.ee022ffgg-3, 8LSC63.ee030ffgg-3, 8LSC63.ee045ffgg-3, 8LSC64.ee022ffgg-3, 8LSC64.ee030ffgg-3, 8LSC64.ee045ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSC65. ee022ffgg-3	8LSC65. ee030ffgg-3	8LSC65. ee045ffgg-3	8LSC66. ee022ffgg-3	8LSC66. ee030ffgg-3	8LSC66. ee045ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2200	3000	4500	2200	3000	4500
Number of pole pairs	4					
Nominal torque $M_N$ [Nm]	28.6	27.3	15.86	31.85	30.55	19.5
Nominal power $P_N$ [W]	6589	8577	7474	7338	9598	9189
Nominal current $I_N$ [A]	12.9	16.8	14.5	14.4	18.8	17.9
Stall torque $M_0$ [Nm]	31.2			36.4		
Stall current $I_0$ [A]	14.1	19.2	28.6	16.4	22.4	33.4
Maximum torque $M_{max}$ [Nm]	97.92			114.24		
Maximum current $I_{max}$ [A]	64.31	90.9	130.49	74.41	103.49	152.61
Maximum speed $n_{max}$ [rpm]	9000					
Torque constant $K_T$ [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant $K_E$ [V/1000 rpm]	134	98.4	66	134	98.4	66
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.94	0.484	0.2	0.72	0.382	0.19
Stator inductance $L_{zph}$ [mH]	10.9	6	2.48	10.4	4.87	2.1
Electrical time constant $t_{el}$ [ms]	11.6	12.4		14.4	12.7	11.1
Thermal time constant $t_{therm}$ [min]	48			52		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	15.6			18.06		
Mass without brake $m$ [kg]	20.4			23		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	32					
Brake mass [kg]	1.6					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	5.85					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180	1320		1180	1320	1640
ACOPOS multi inverter module 8BVxxxx...	0220		0330	0220	0330	0440
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5	4		1.5	4	10
Connector type	speedtec					
Connector size	1.0					1.5

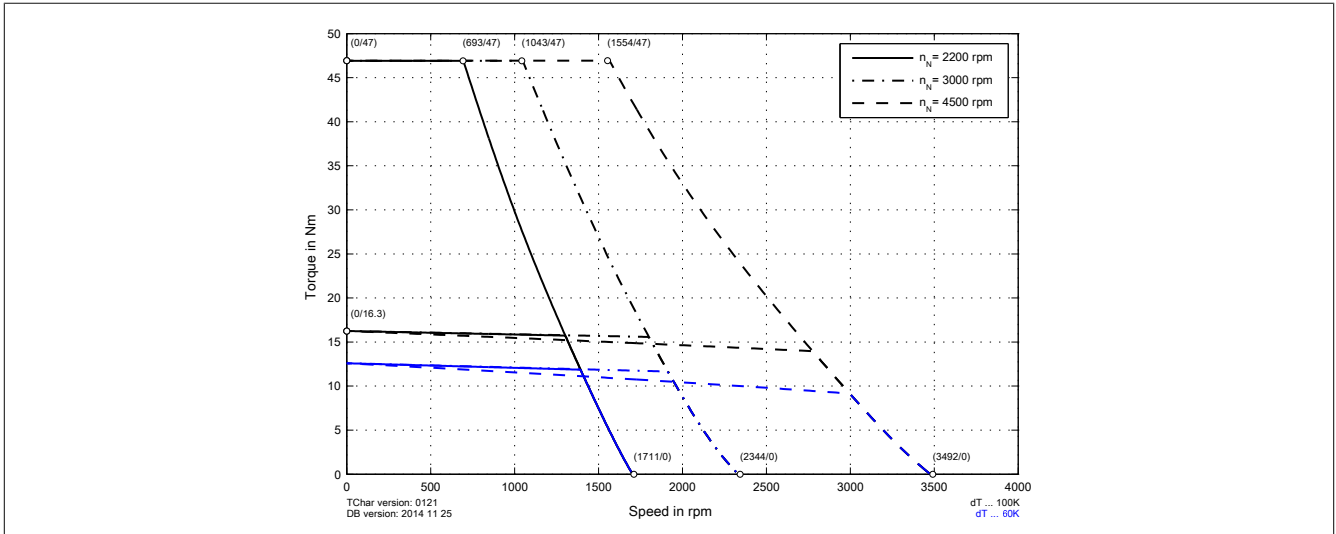
Table 75: 8LSC65.ee022ffgg-3, 8LSC65.ee030ffgg-3, 8LSC65.ee045ffgg-3, 8LSC66.ee022ffgg-3, 8LSC66.ee030ffgg-3, 8LSC66.ee045ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

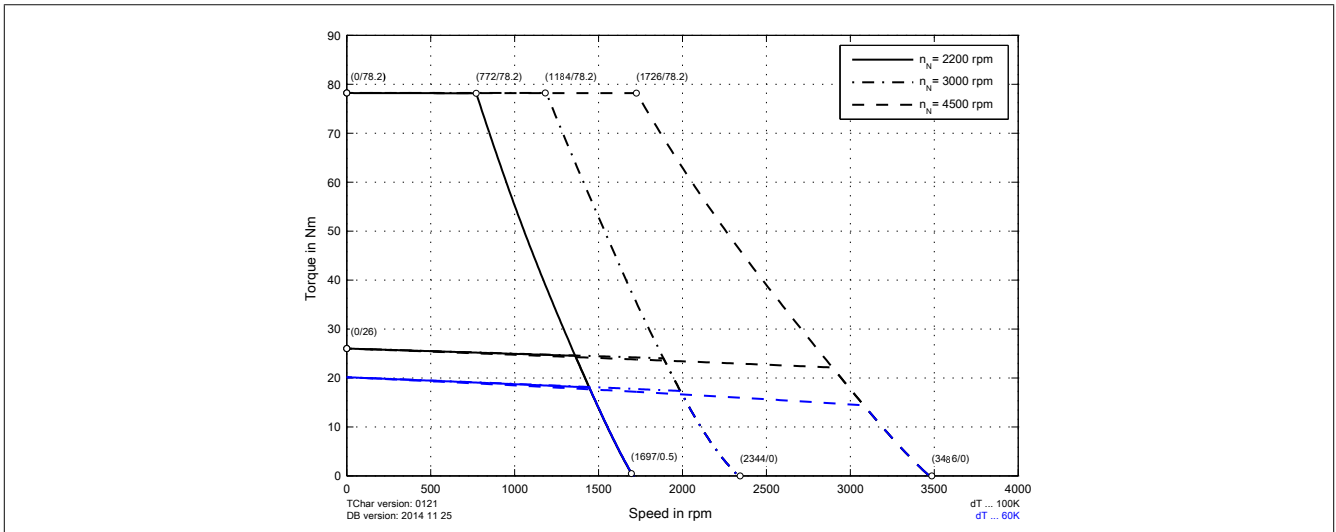
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

2.8.3.1 Speed-torque characteristics at DC bus voltage of 325 VDC

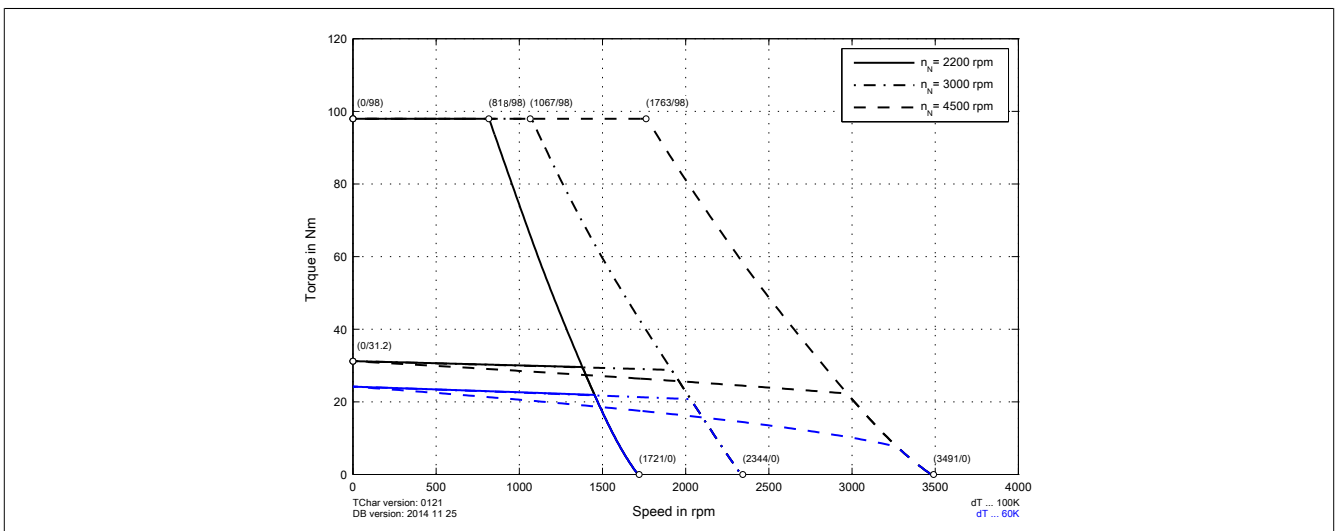
8LSC63.eennffgg-3



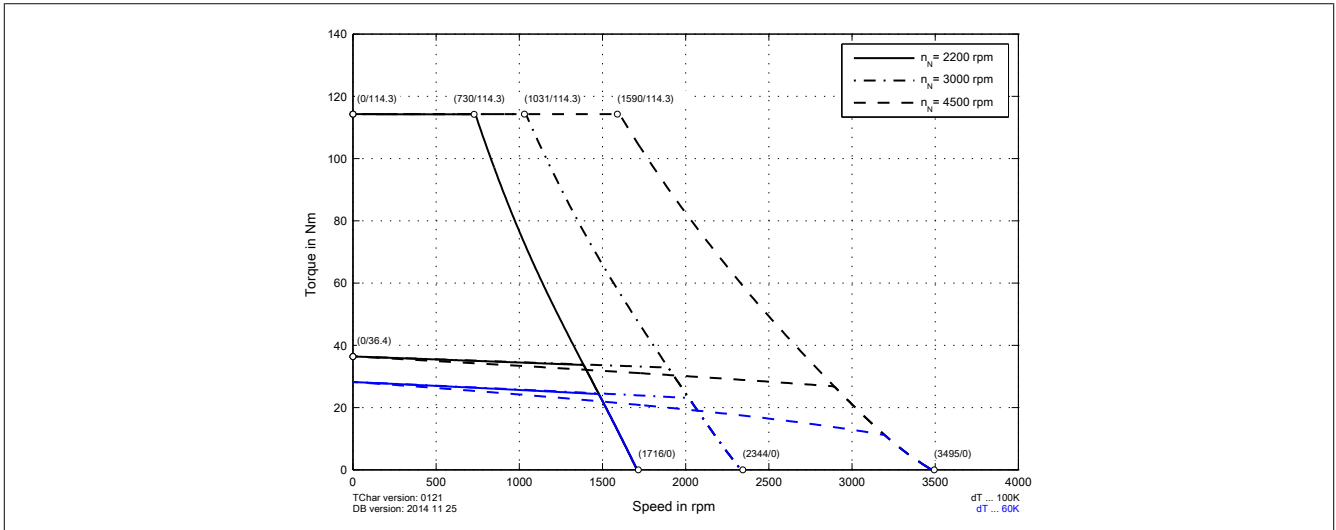
8LSC64.eennffgg-3



8LSC65.eennffgg-3



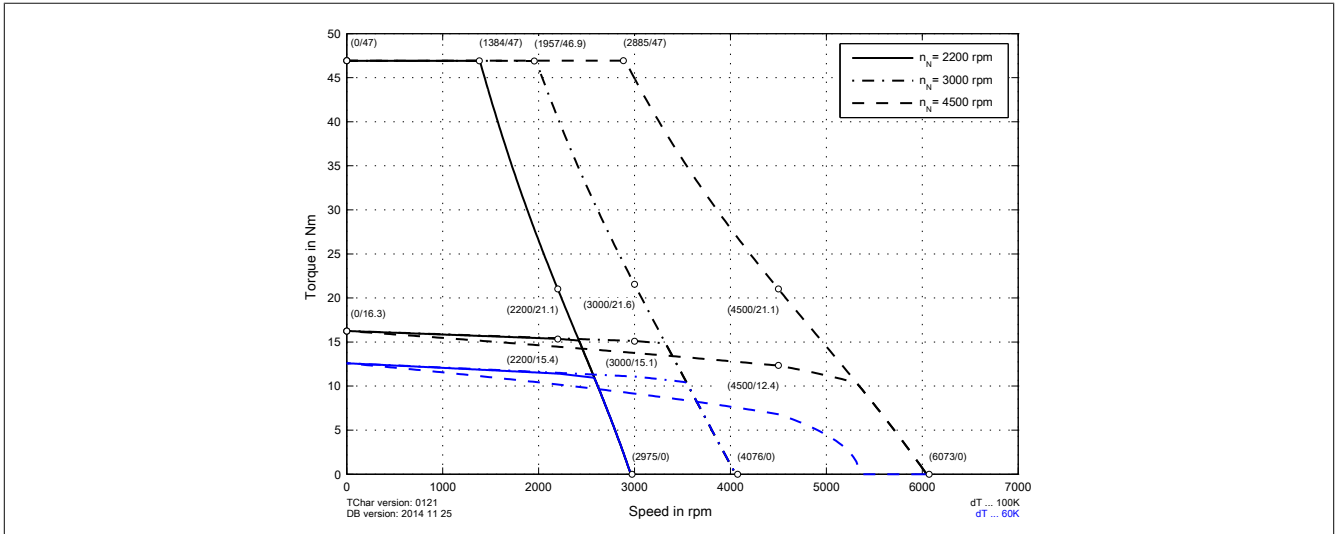
8LSC66.eennffgg-3



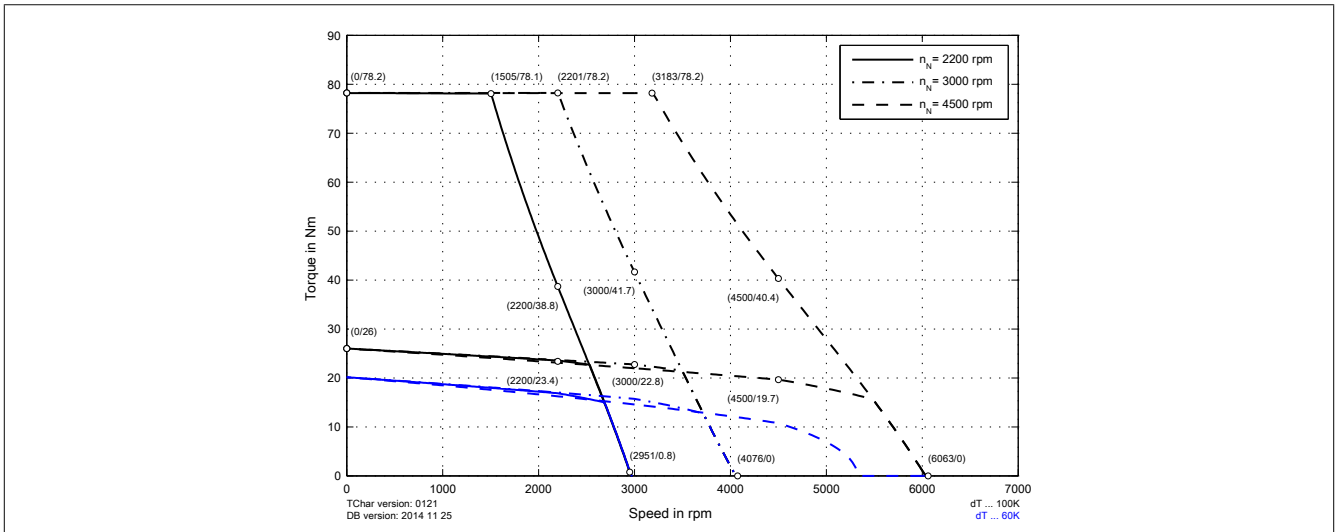


### 2.8.3.2 Speed-torque characteristics at DC bus voltage of 560 VDC

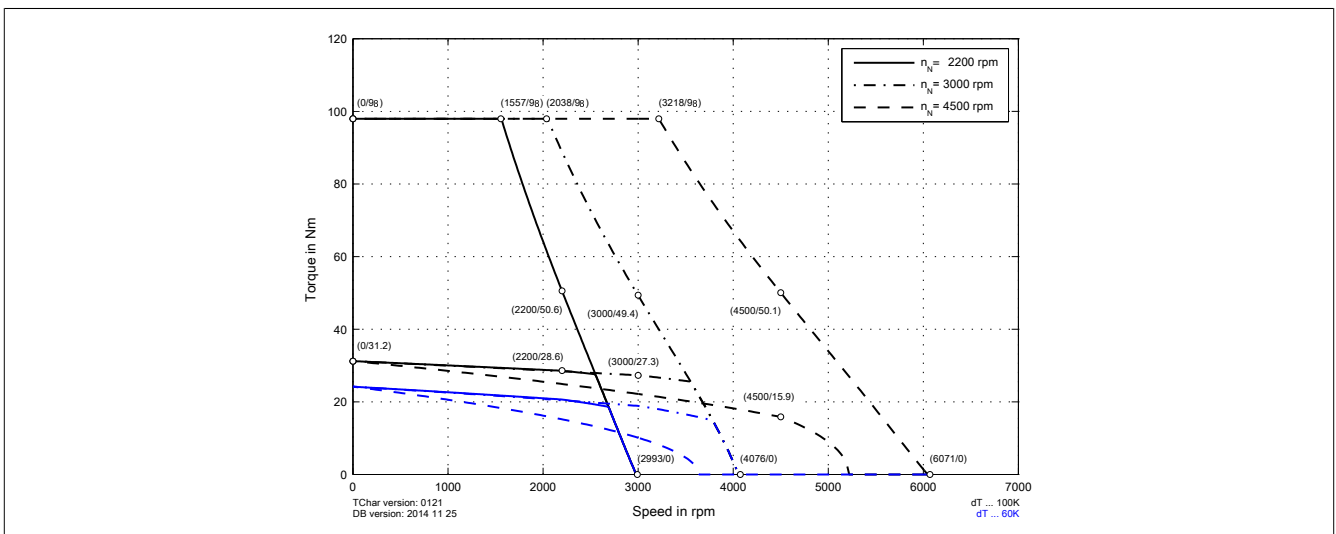
#### 8LSC63.eennffgg-3



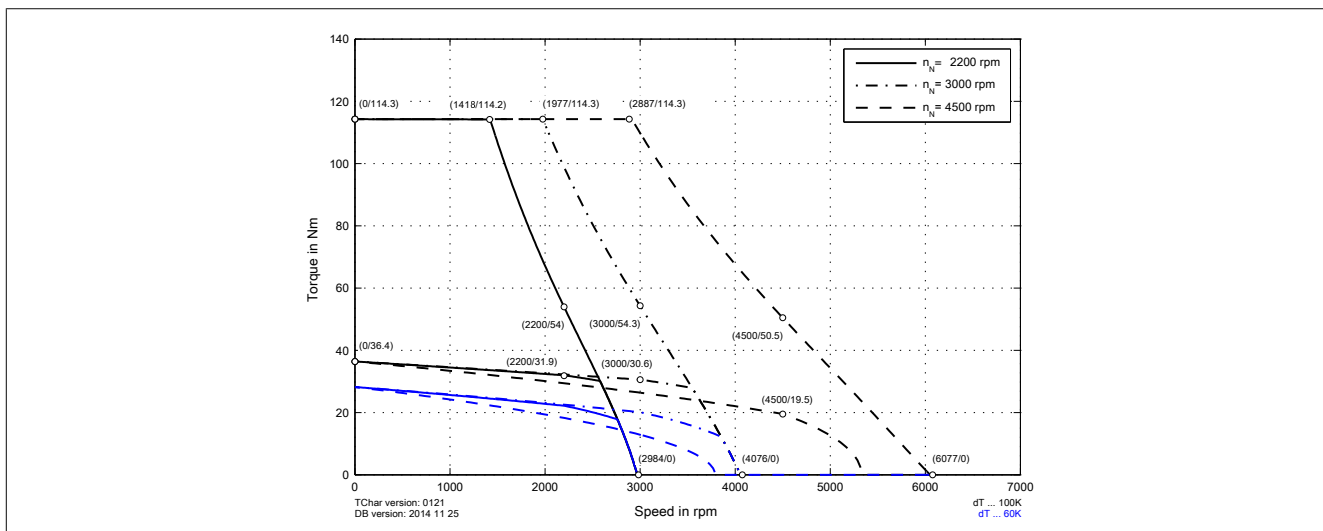
#### 8LSC64.eennffgg-3



#### 8LSC65.eennffgg-3

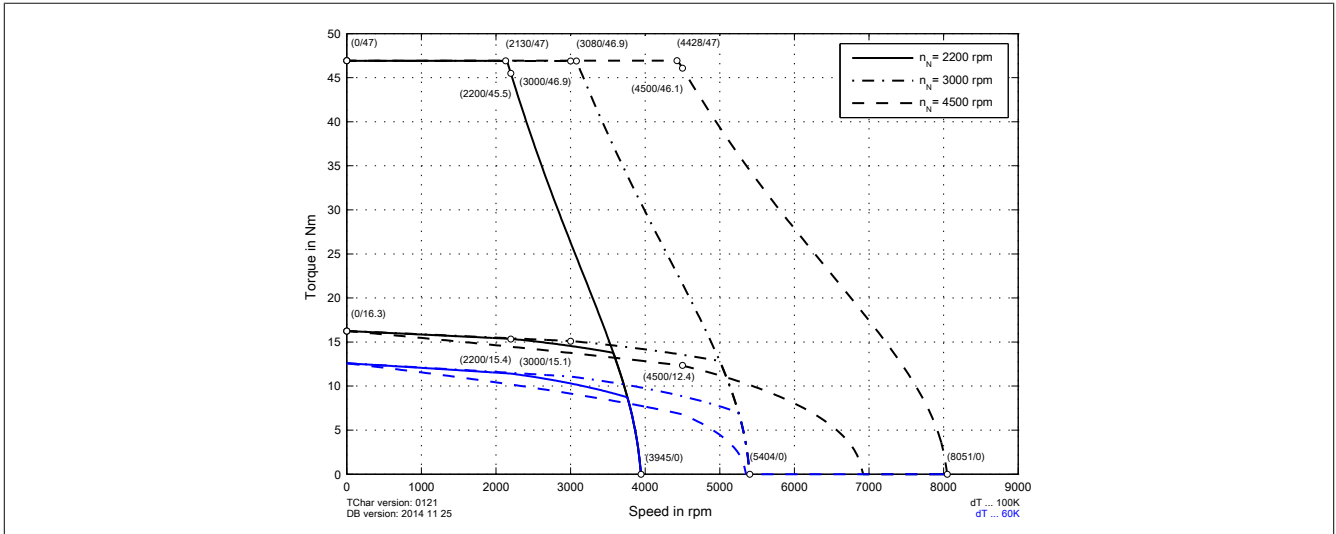


8LSC66.eennffgg-3

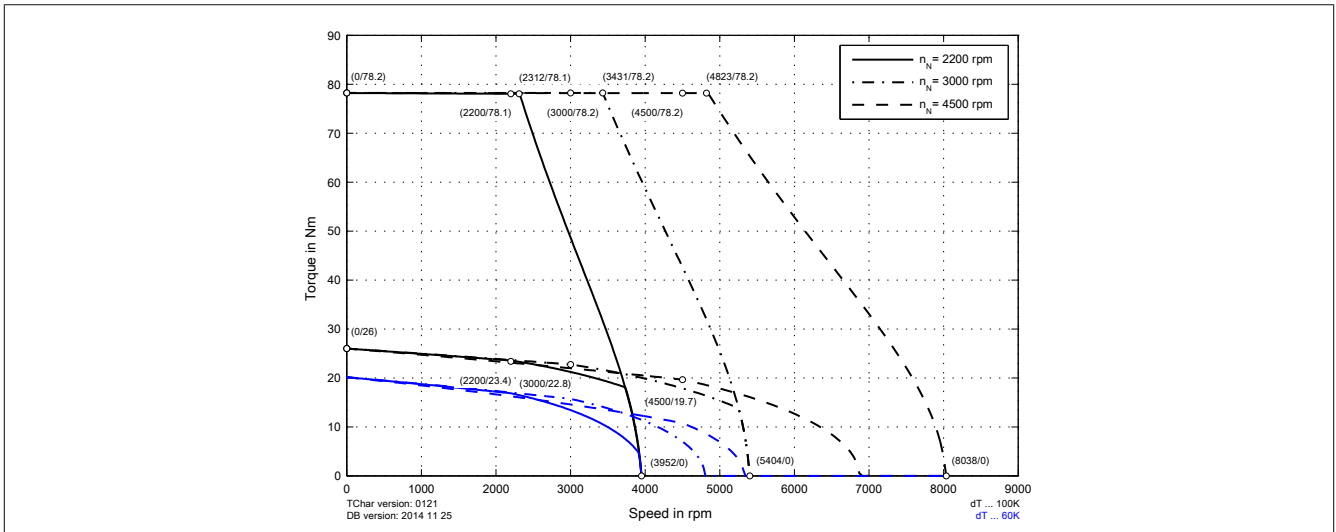


### 2.8.3.3 Speed-torque characteristics at DC bus voltage of 750 VDC

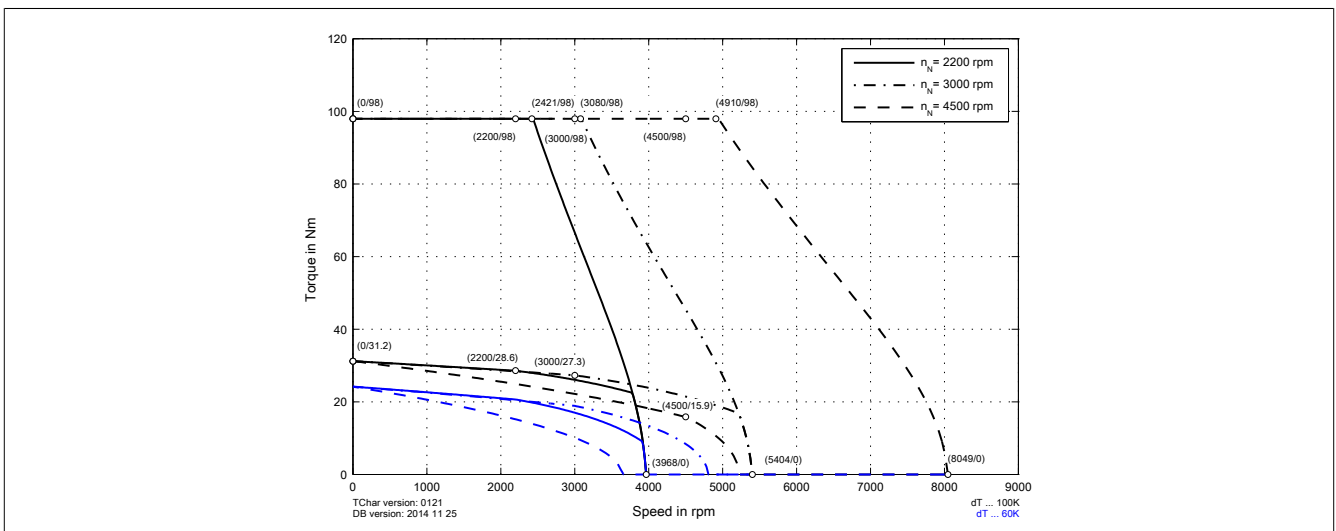
#### 8LSC63.eennffgg-3



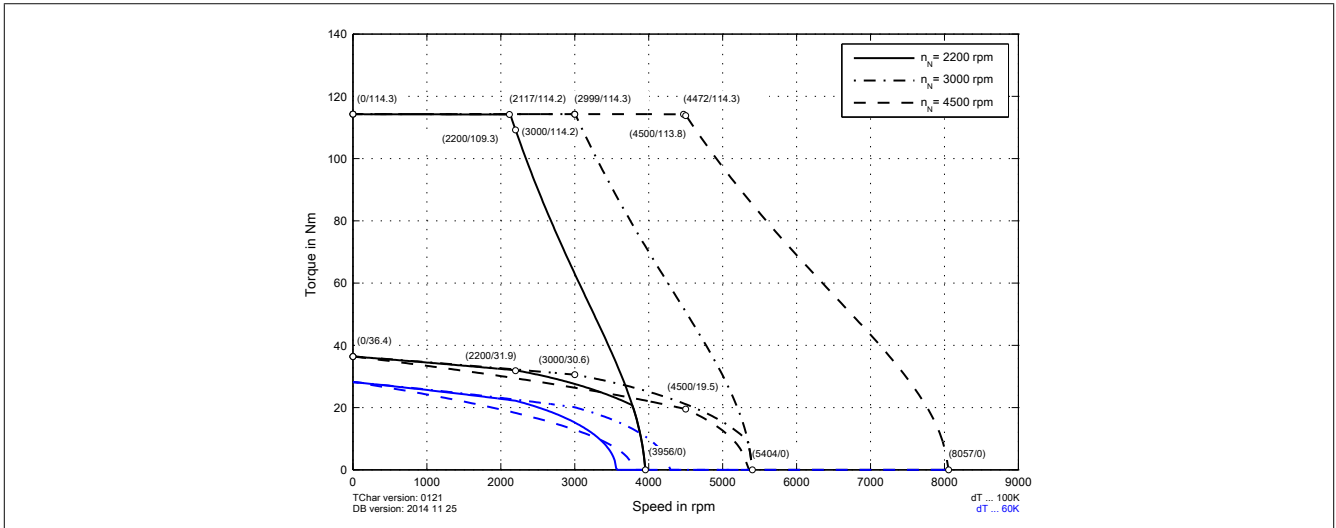
#### 8LSC64.eennffgg-3



#### 8LSC65.eennffgg-3



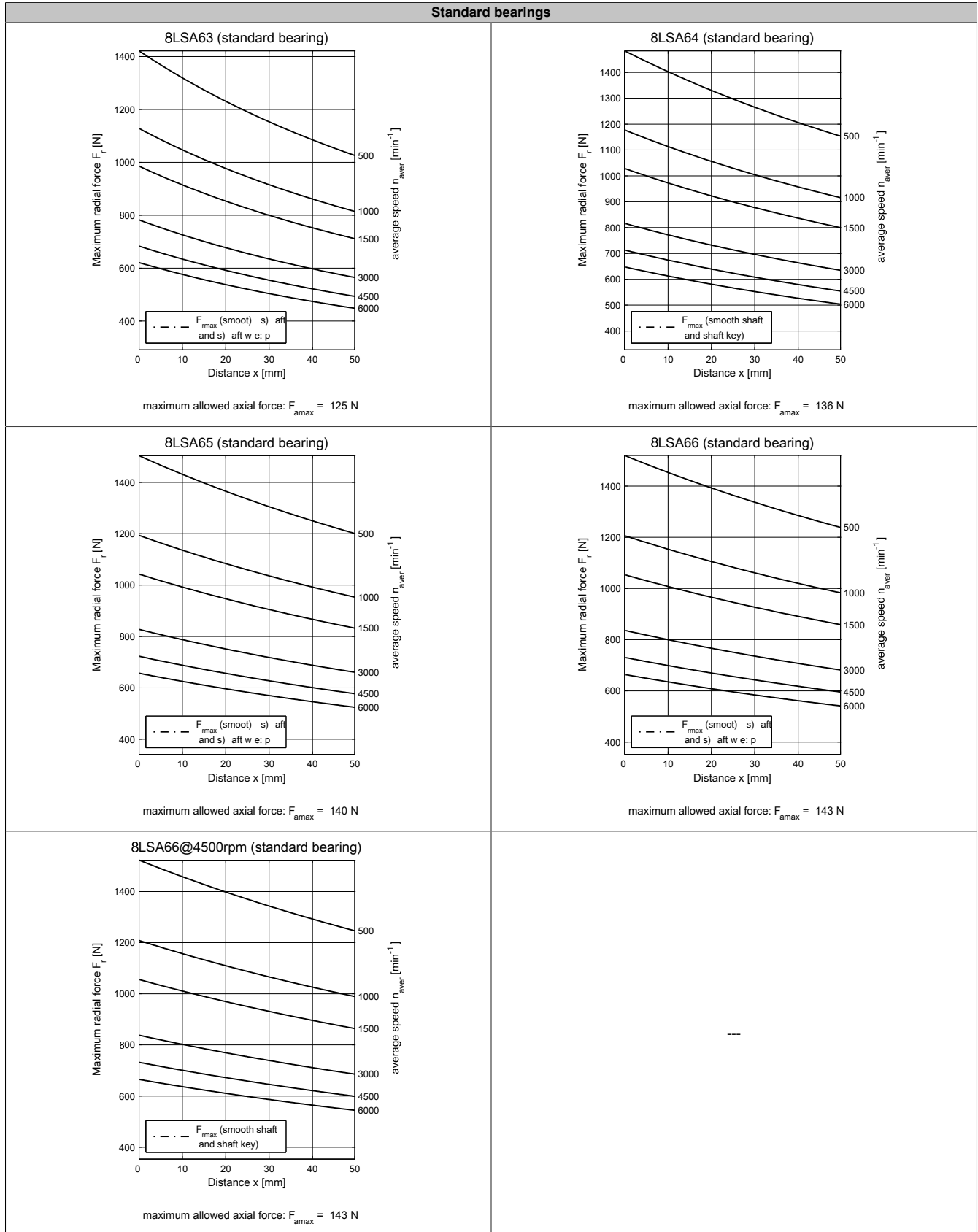
8LSC66.eennffgg-3



### 2.8.3.4 Permissible shaft load

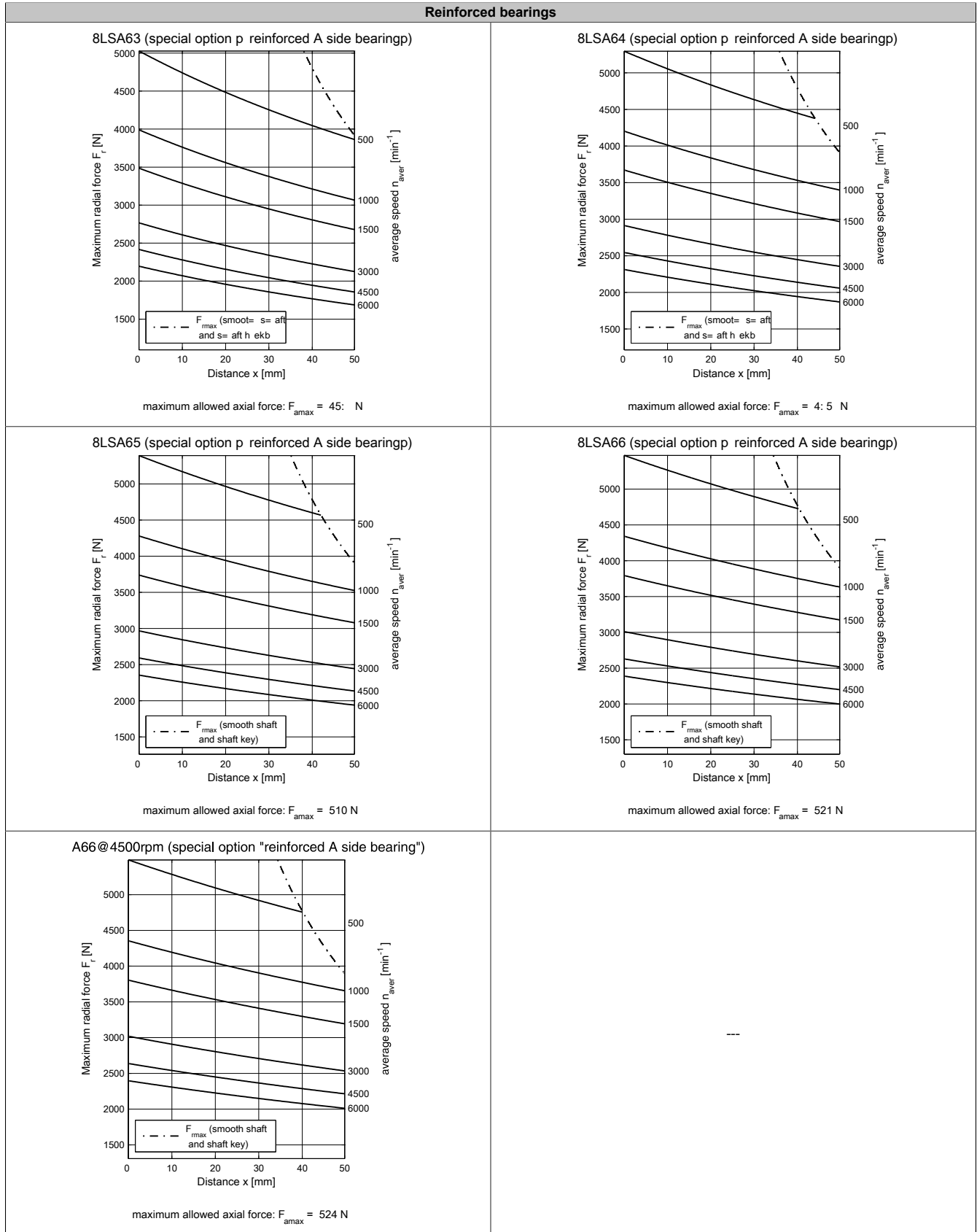
#### 2.8.3.4.1 8LSA/C6 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!

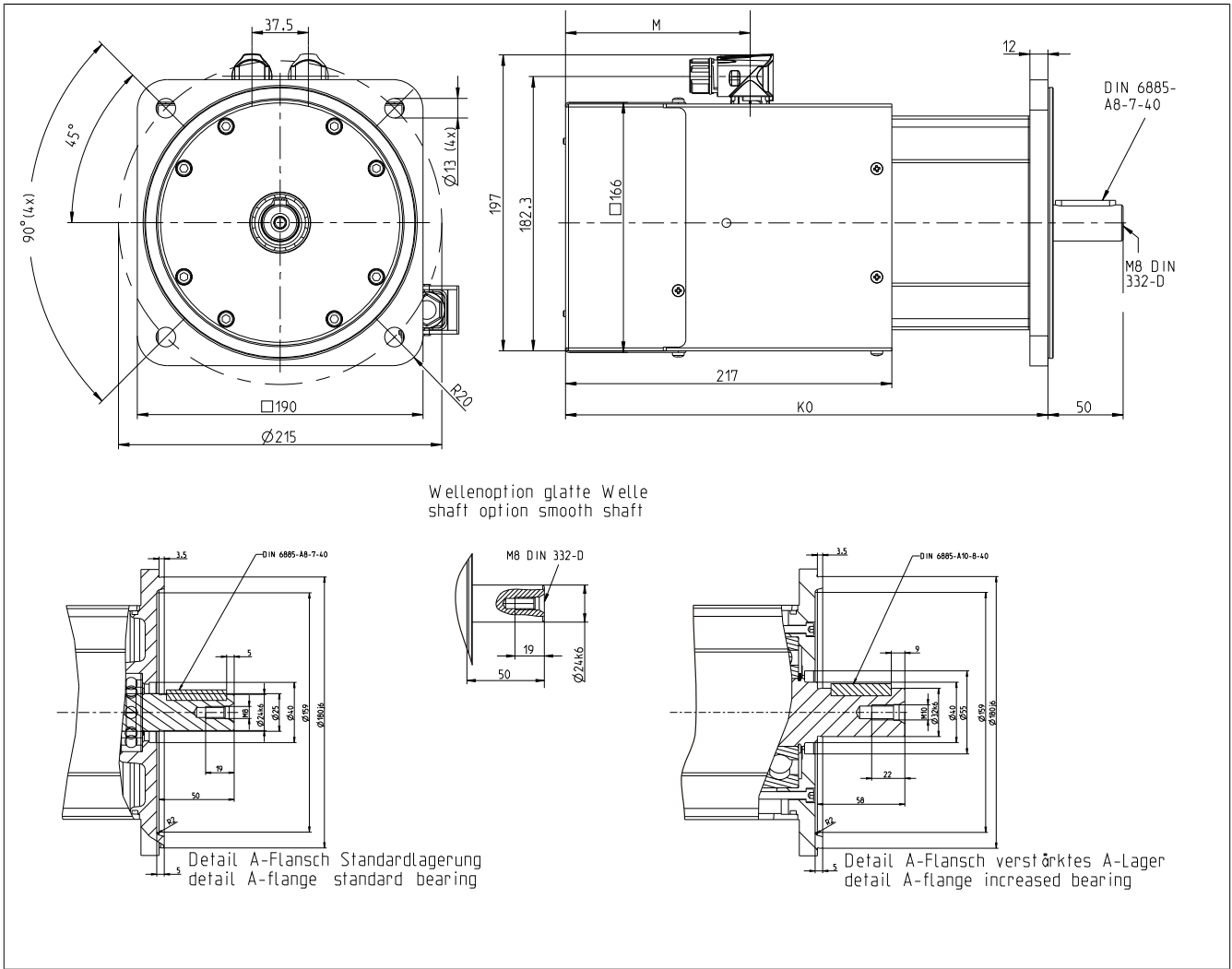


2.8.3.4.2 8LSA/C6 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!



2.8.3.5 8LSC6 V3 - Dimensions



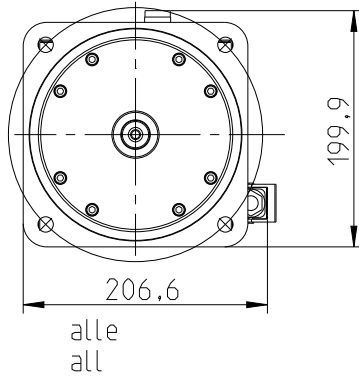
EnDat/Resolver feedback Model number	K <sub>0</sub>	M	Extension of K <sub>0</sub> and M depending on the motor option [mm]		
			Holding brake	Heavy duty holding brake	Reinforced bearing A-side
8LSC63.eennffgg-3	276	123	60	70	28
8LSC64.eennffgg-3	321	123	60	70	28
8LSC65.eennffgg-3	344	123	60	70	28
8LSC66.eennffgg-3	366	123	60	70	28
<b>8LSC66.ee045ffgg-3, power connector size 1.5!</b>	381	131	60	70	28

Whether or not an oil seal is used has no effect on the length of the motor.

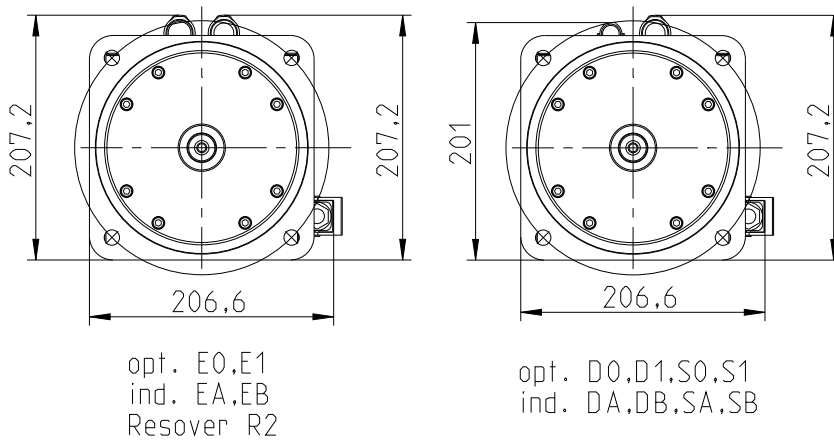
2.8.3.5.1 8LSC6 V3 - Connector options - Dimensions

Size 1

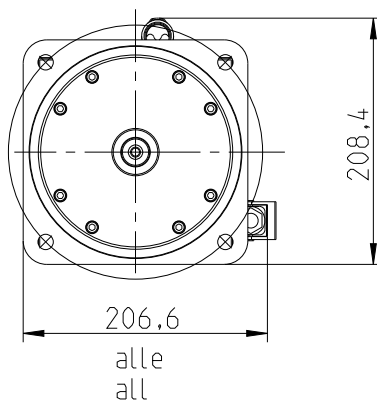
Option C



Option D



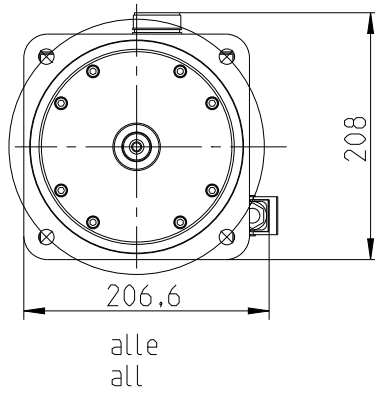
Option S



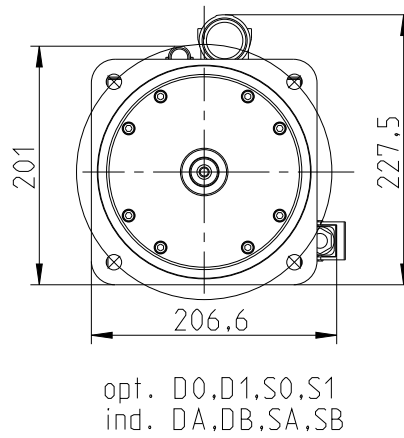
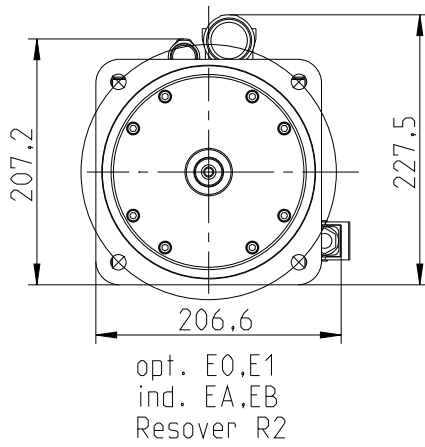


Size 1.5

Option C



Option D



## 2.8.4 Technical data - 8LSC7 V3

Model number	8LSC73. ee020ffgg-3	8LSC73. ee022ffgg-3	8LSC73. ee030ffgg-3	8LSC73. ee045ffgg-3	8LSC74. ee020ffgg-3	8LSC74. ee022ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2000	2200	3000	4500	2000	2200
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	29	28.5	26.8	21.5	37.5	36.8
Nominal power $P_N$ [W]	6074	6566	8419	10132	7854	8478
Nominal current $I_N$ [A]	11.885	12.838	16.442	19.725	15.369	16.577
Stall torque $M_0$ [Nm]	33.8		33		43	
Stall current $I_0$ [A]	13.852	15.225	20.736	30	17.623	19.369
Maximum torque $M_{max}$ [Nm]	107				150	
Maximum current $I_{max}$ [A]	64.5	71	96.54	144	90.4	99
Maximum speed $n_{max}$ [rpm]	6000					
Torque constant $K_T$ [Nm/A]	2.44	2.22	1.63	1.09	2.44	2.22
Voltage constant $K_E$ [V/1000 rpm]	147.65	134.04	98.44	65.97	147.65	134.04
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.93	0.72	0.42	0.19	0.63	0.54
Stator inductance $L_{zph}$ [mH]	14.6	12.3	6.5	2.9	10.9	9
Electrical time constant $t_{el}$ [ms]	15.699	17.08	15.476	15.263	17.302	16.667
Thermal time constant $t_{therm}$ [min]	37				41	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	46				60	
Mass without brake $m$ [kg]	20				24	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	47					
Brake mass [kg]	3.8					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	32					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180		1320			
ACOPOS multi inverter module 8BVlxxxx...	0220		0330		0220	
Cross section for B&R motor cables [mm <sup>2</sup> ]	1.5		4		1.5	4
Connector type	speedtec					
Connector size	1.0		1.5		1.0	

Table 76: 8LSC73.ee020ffgg-3, 8LSC73.ee022ffgg-3, 8LSC73.ee030ffgg-3, 8LSC73.ee045ffgg-3, 8LSC74.ee020ffgg-3, 8LSC74.ee022ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSC74. ee030ffgg-3	8LSC74. ee045ffgg-3	8LSC75. ee011ffgg-3	8LSC75. ee015ffgg-3	8LSC75. ee020ffgg-3	8LSC75. ee022ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000	4500	1100	1500	2000	2200
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	34	24.6	51	49	46.7	45.5
Nominal power $P_N$ [W]	10681	11592	5875	7697	9781	10482
Nominal current $I_N$ [A]	20.859	22.569	11.512	15.031	19.139	20.495
Stall torque $M_0$ [Nm]	43		56			
Stall current $I_0$ [A]	26.38	39.45	12.641	17.178	23	25.2
Maximum torque $M_{max}$ [Nm]	150		187			
Maximum current $I_{max}$ [A]	135.33	202	62	84	113	124
Maximum speed $n_{max}$ [rpm]	6000		4500			
Torque constant $K_T$ [Nm/A]	1.63	1.09	4.43	3.26	2.44	2.22
Voltage constant $K_E$ [V/1000 rpm]	98.44	65.97	268.08	196.87	147.65	134.04
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.28	0.13	1.62	0.84	0.49	0.39
Stator inductance $L_{zph}$ [mH]	4.9	2.2	28.3	15.6	8.8	7.1
Electrical time constant $t_{el}$ [ms]	17.5	16.923	16	17.7	17.959	17.5
Thermal time constant $t_{therm}$ [min]	41		46			
Moment of inertia $J$ [kgcm <sup>2</sup> ]	60		74			
Mass without brake $m$ [kg]	24		28			
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]			47			
Brake mass [kg]			3.8			
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]			32			
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1320	1640	1180		1320	
ACOPOS multi inverter module 8BVxxxx...	0330	0440	0110	0220	0330	
Cross section for B&R motor cables [mm <sup>2</sup> ]	4	10	1.5		4	
Connector type	speedtec					
Connector size	1.0	1.5	1.0			

Table 77: 8LSC74.ee030ffgg-3, 8LSC74.ee045ffgg-3, 8LSC75.ee011ffgg-3, 8LSC75.ee015ffgg-3, 8LSC75.ee020ffgg-3, 8LSC75.ee022ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSC75. ee030ffgg-3	8LSC76. ee015ffgg-3	8LSC76. ee022ffgg-3	8LSC76. ee030ffgg-3	8LSC77. ee030ffgg-3	8LSC78. ee030ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	3000	1500	2200	3000		
Number of pole pairs	5					
Nominal torque $M_N$ [Nm]	41	66	57.6	47.3	53.6	59
Nominal power $P_N$ [W]	12881	10367	13270	14860	16839	18535
Nominal current $I_N$ [A]	25.153	20.25	25.9	29	32.9	36.2
Stall torque $M_0$ [Nm]	48.9	75		91.2		104
Stall current $I_0$ [A]	30	23	33.8	46	56	63.8
Maximum torque $M_{max}$ [Nm]	187	230		270		330
Maximum current $I_{max}$ [A]	168.71	92.5	136	185	212	260
Maximum speed $n_{max}$ [rpm]	4500					
Torque constant $K_T$ [Nm/A]	1.63	3.26	2.22	1.63		
Voltage constant $K_E$ [V/1000 rpm]	98.44	196.87	134.04	98.43		
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.21	0.57	0.26	0.15	0.11	0.08
Stator inductance $L_{zph}$ [mH]	3.9	11.5	5.1	2.7	2.2	1.8
Electrical time constant $t_{el}$ [ms]	18.571	17.85	19.6	18	18.2	22.5
Thermal time constant $t_{therm}$ [min]	46	56		65		74
Moment of inertia $J$ [kgcm <sup>2</sup> ]	74	102		130		158
Mass without brake $m$ [kg]	28	36		44		52
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	47					
Brake mass [kg]	3.8					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	32					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1320		1640		128M	
ACOPOS multi inverter module 8BVxxxx...	0330		0440	0660		0880
Cross section for B&R motor cables [mm <sup>2</sup> ]	4		10		16	
Connector type	speedtec					
Connector size	1.5					

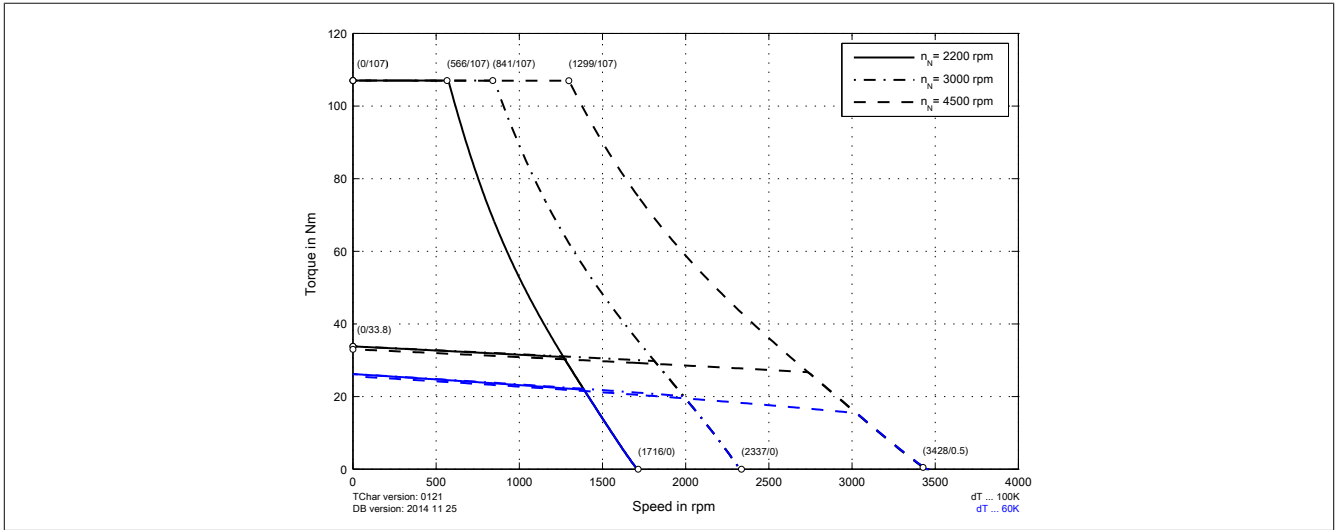
Table 78: 8LSC75.ee030ffgg-3, 8LSC76.ee015ffgg-3, 8LSC76.ee022ffgg-3, 8LSC76.ee030ffgg-3, 8LSC77.ee030ffgg-3, 8LSC78.ee030ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

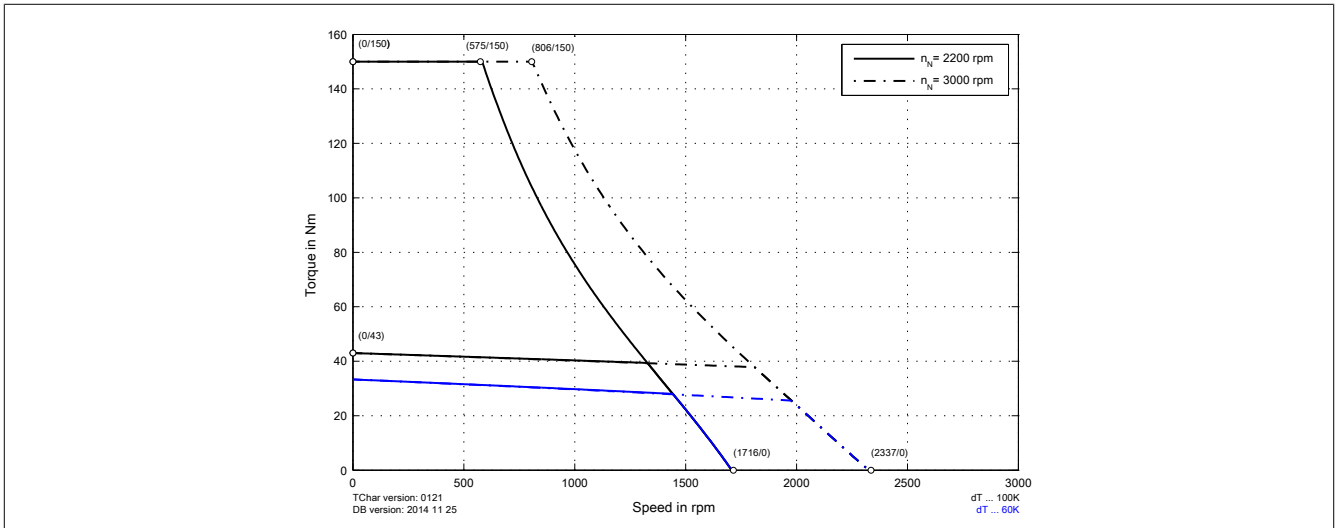
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

2.8.4.1 Speed-torque characteristics at DC bus voltage of 325 VDC

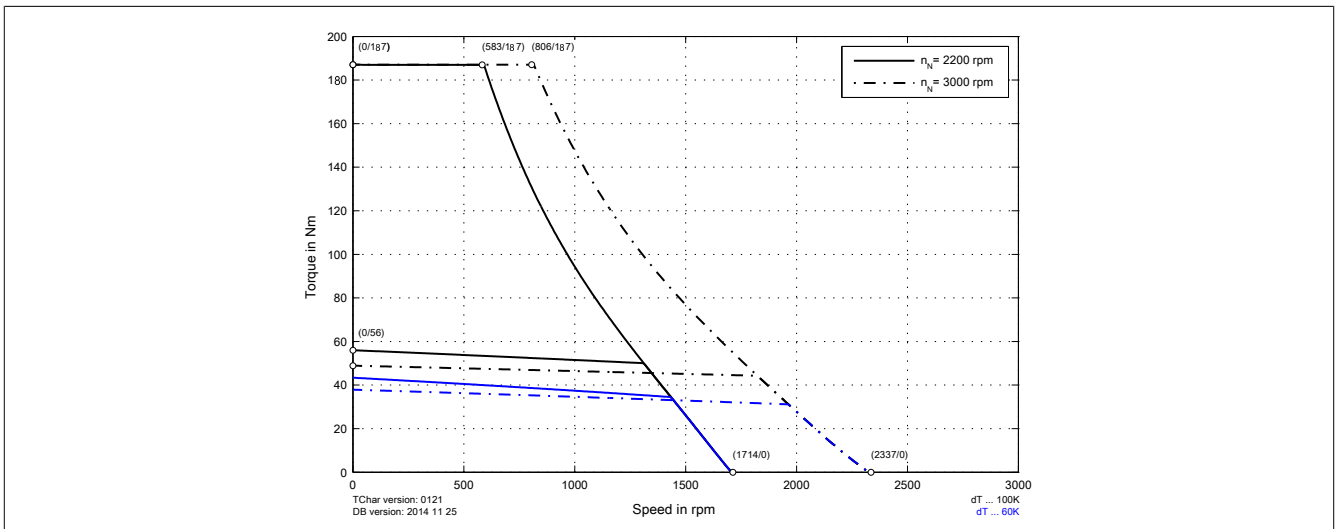
8LSC73.eennffgg-3



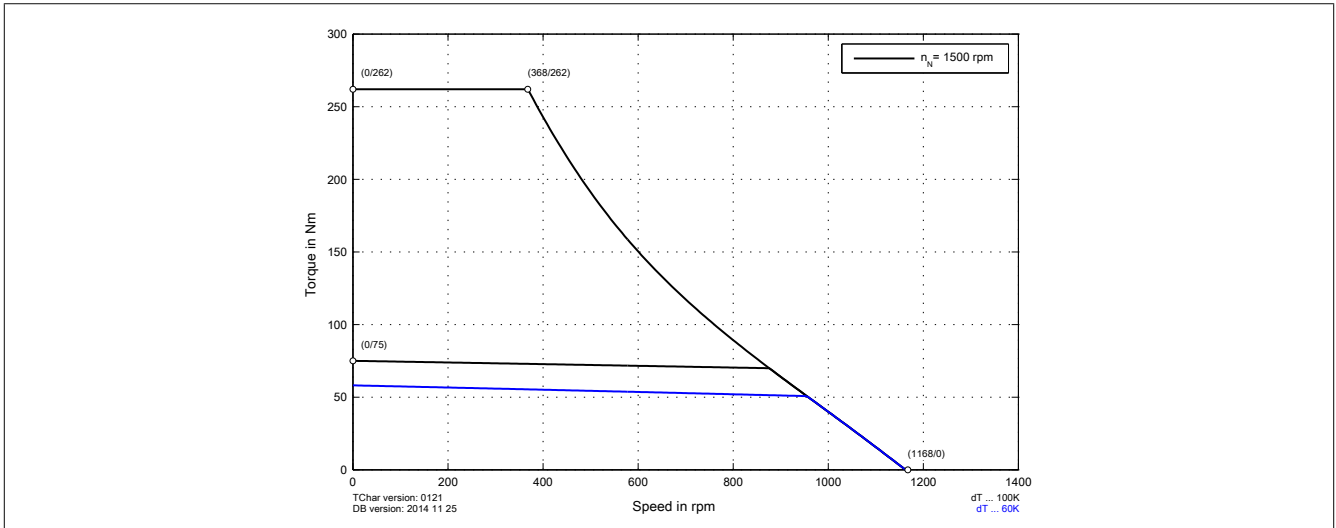
8LSC74.eennffgg-3



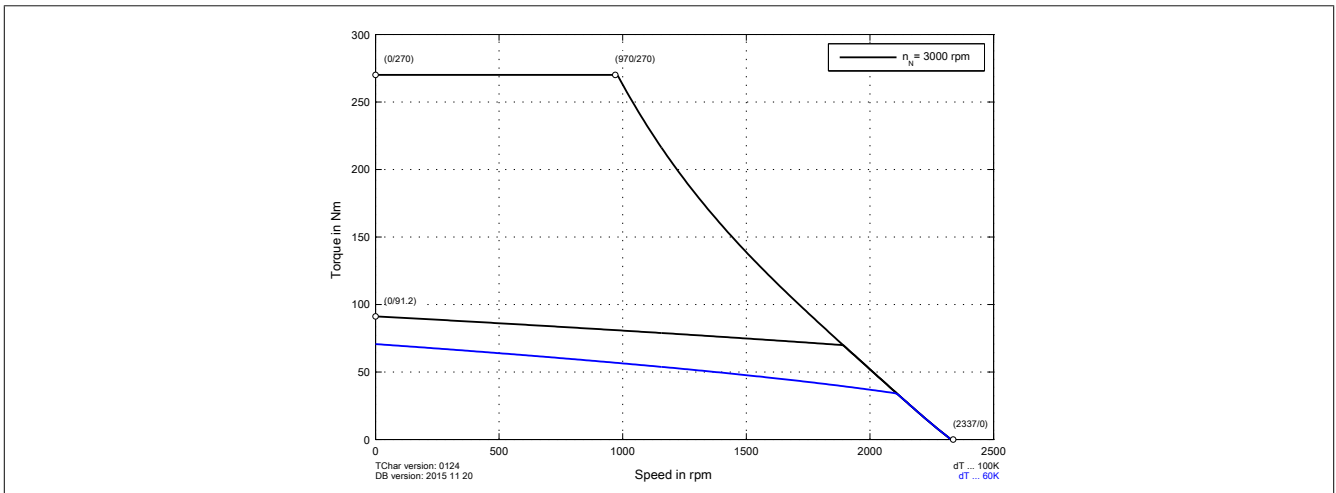
8LSC75.eennffgg-3



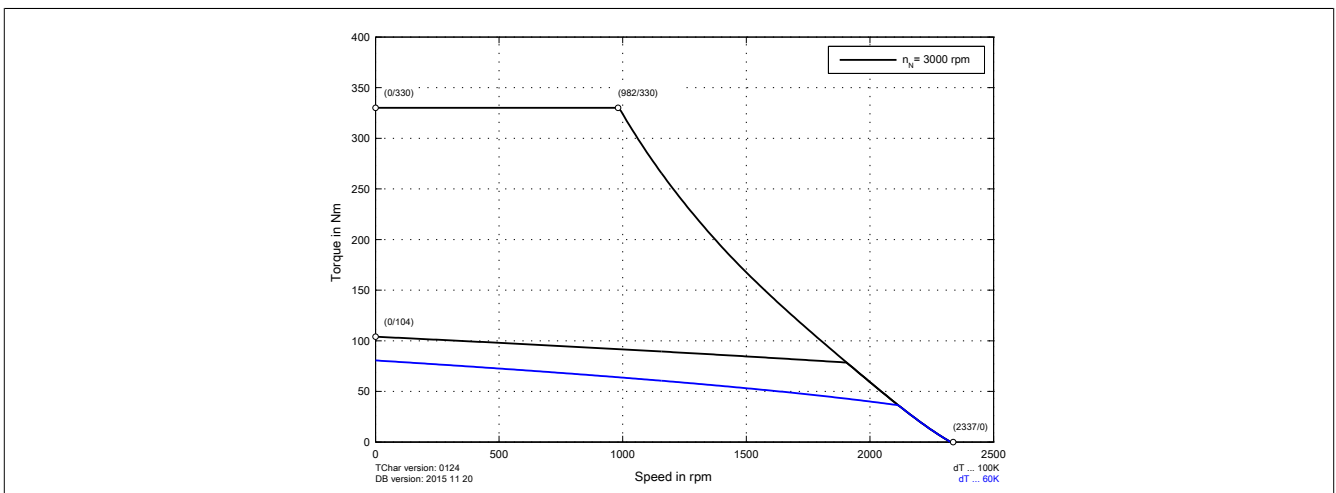
8LSC76.eennffgg-3



8LSC77.eennffgg-3

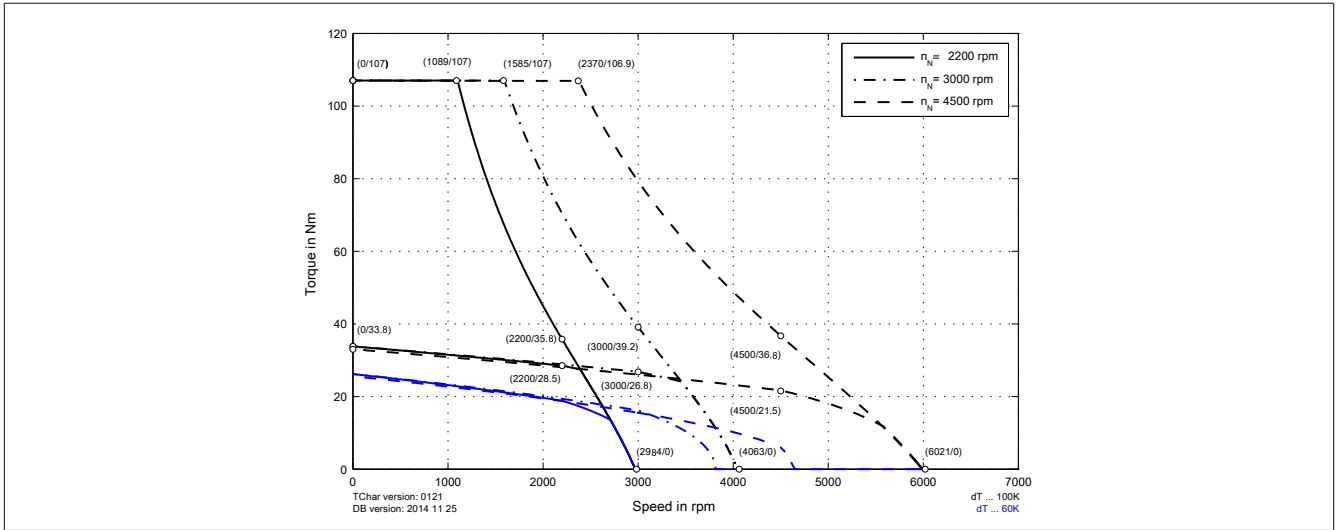


8LSC78.eennffgg-3

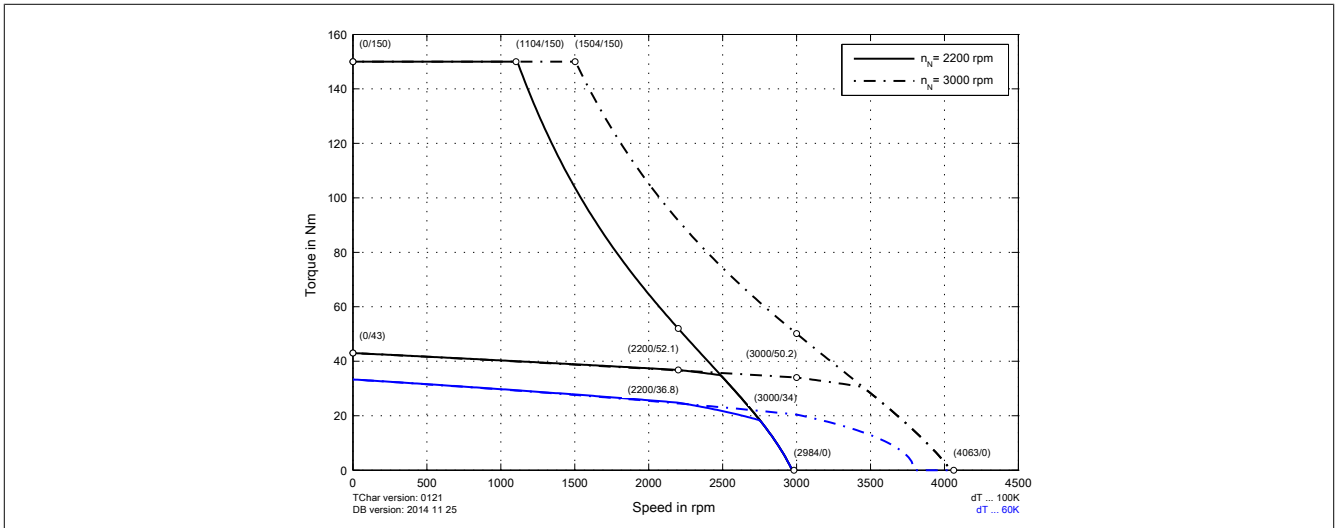


### 2.8.4.2 Speed-torque characteristics at DC bus voltage of 560 VDC

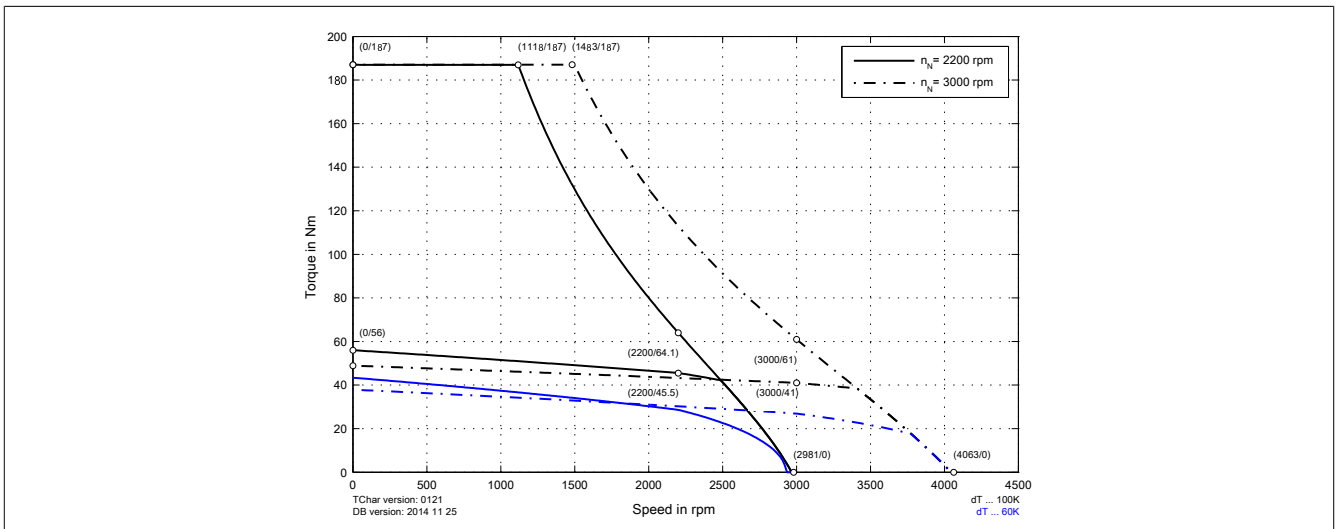
#### 8LSC73.eennffgg-3



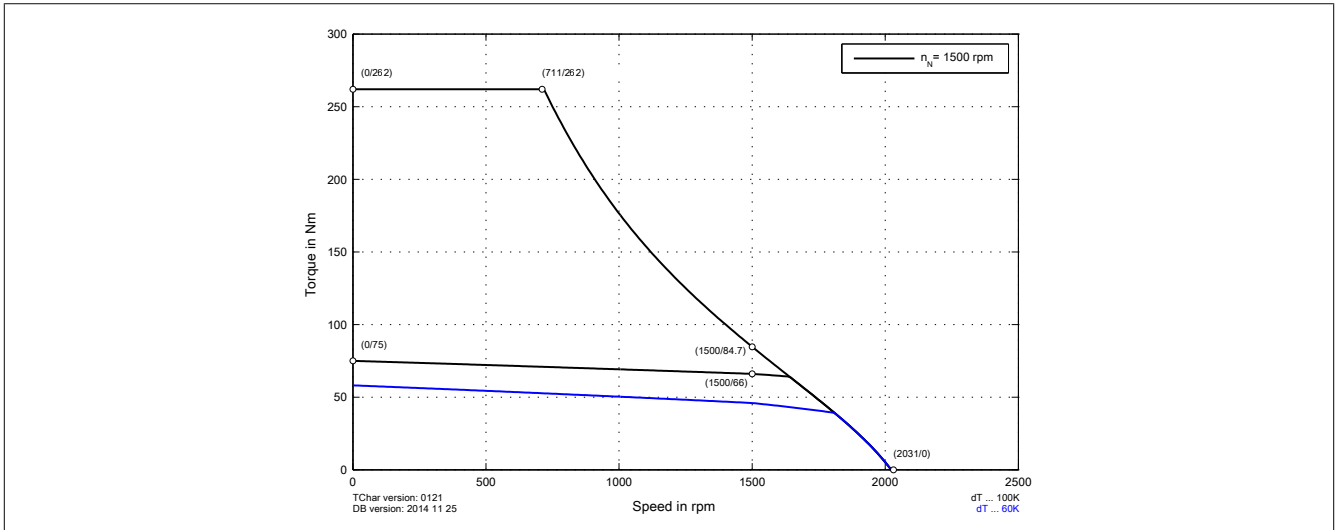
#### 8LSC74.eennffgg-3



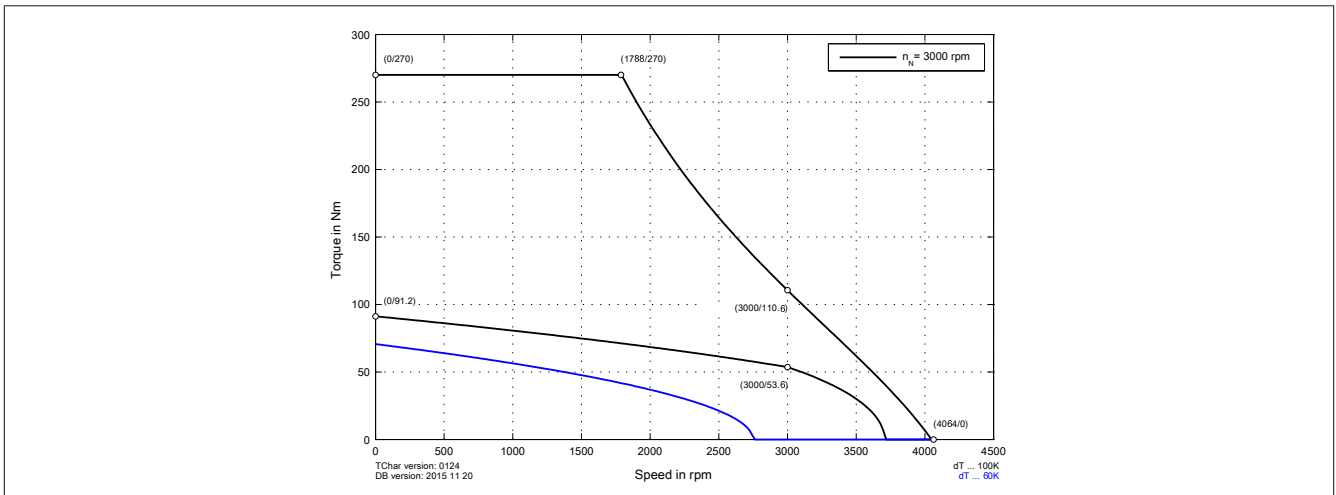
#### 8LSC75.eennffgg-3



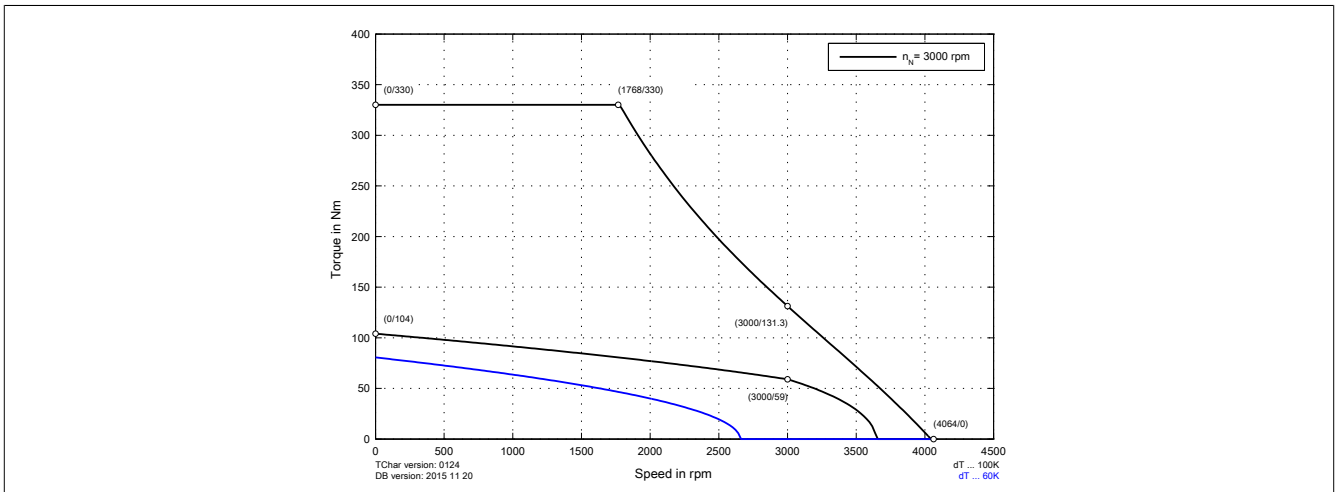
8LSC76.eennffgg-3



8LSC77.eennffgg-3



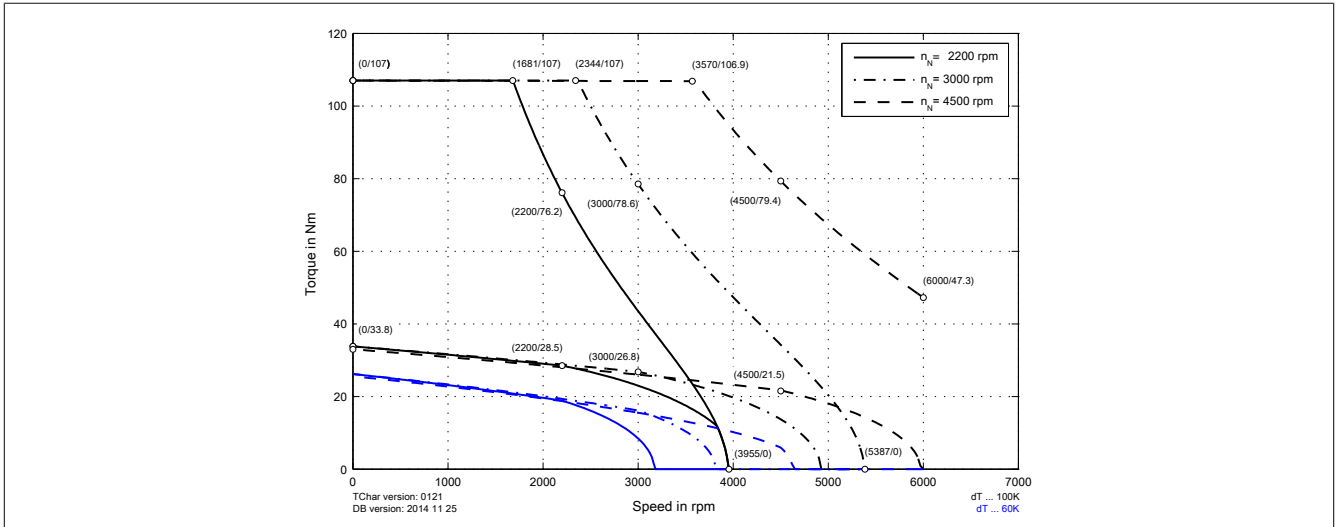
8LSC78.eennffgg-3



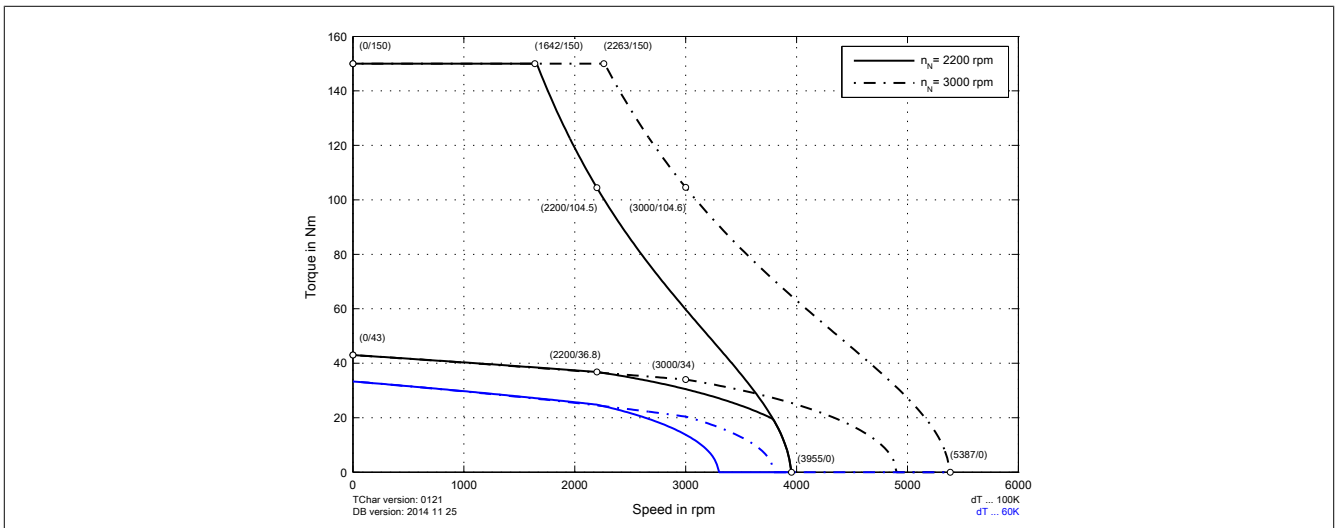


### 2.8.4.3 Speed-torque characteristics at DC bus voltage of 750 VDC

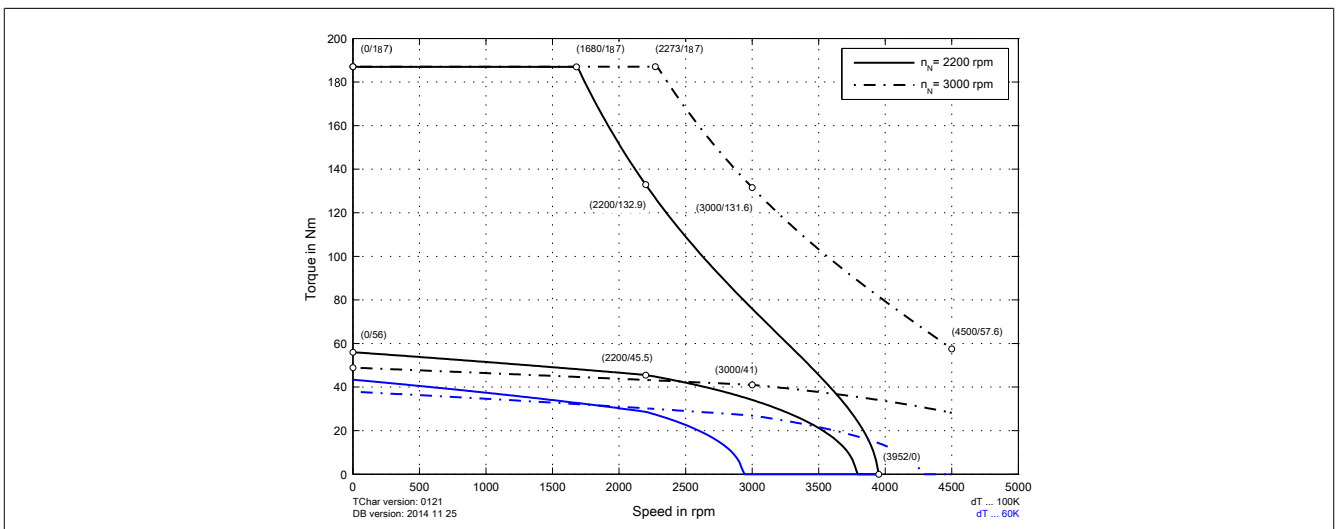
#### 8LSC73.eennffgg-3



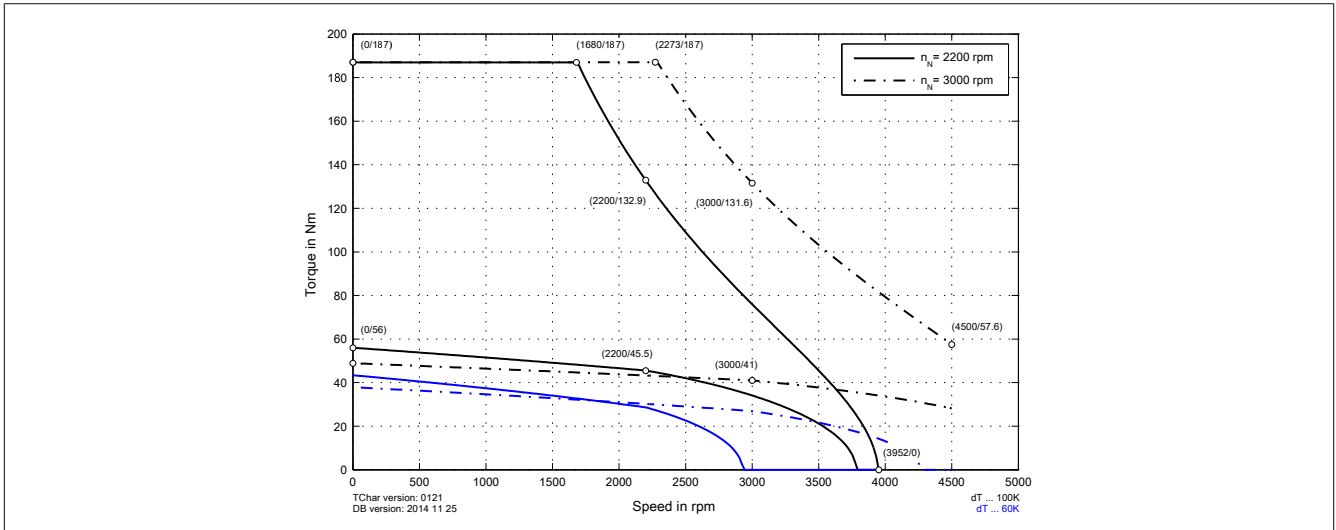
#### 8LSC74.eennffgg-3



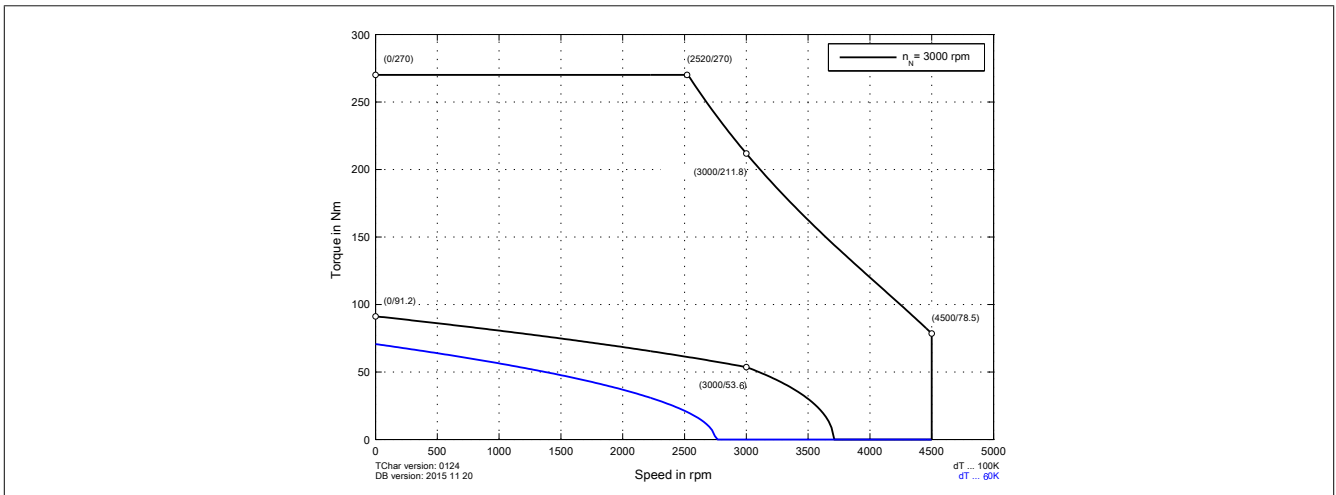
#### 8LSC75.eennffgg-3



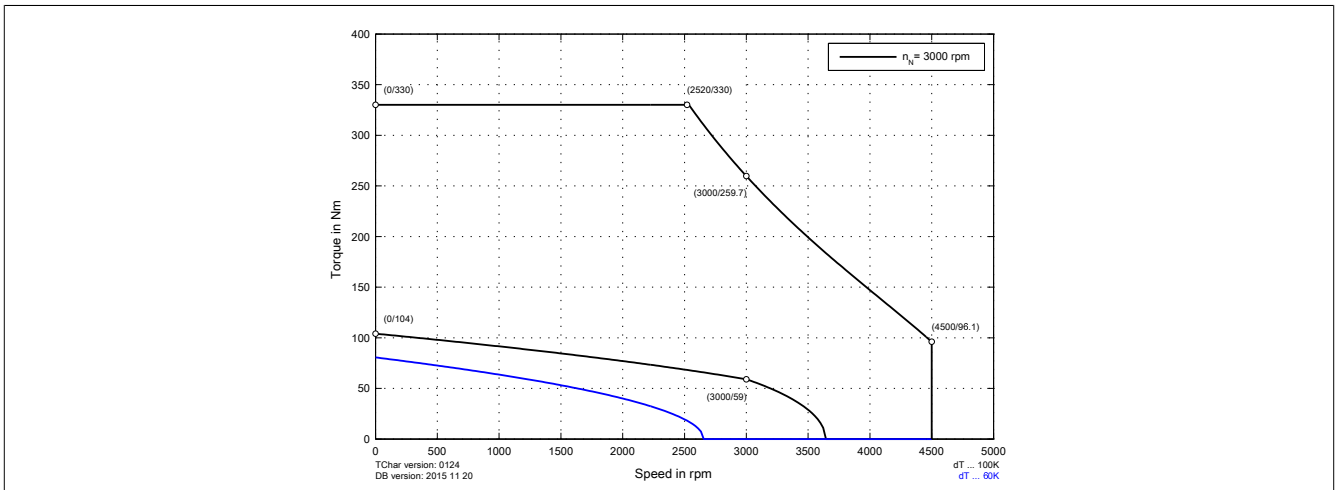
8LSC76.eennffgg-3



8LSC77.eennffgg-3



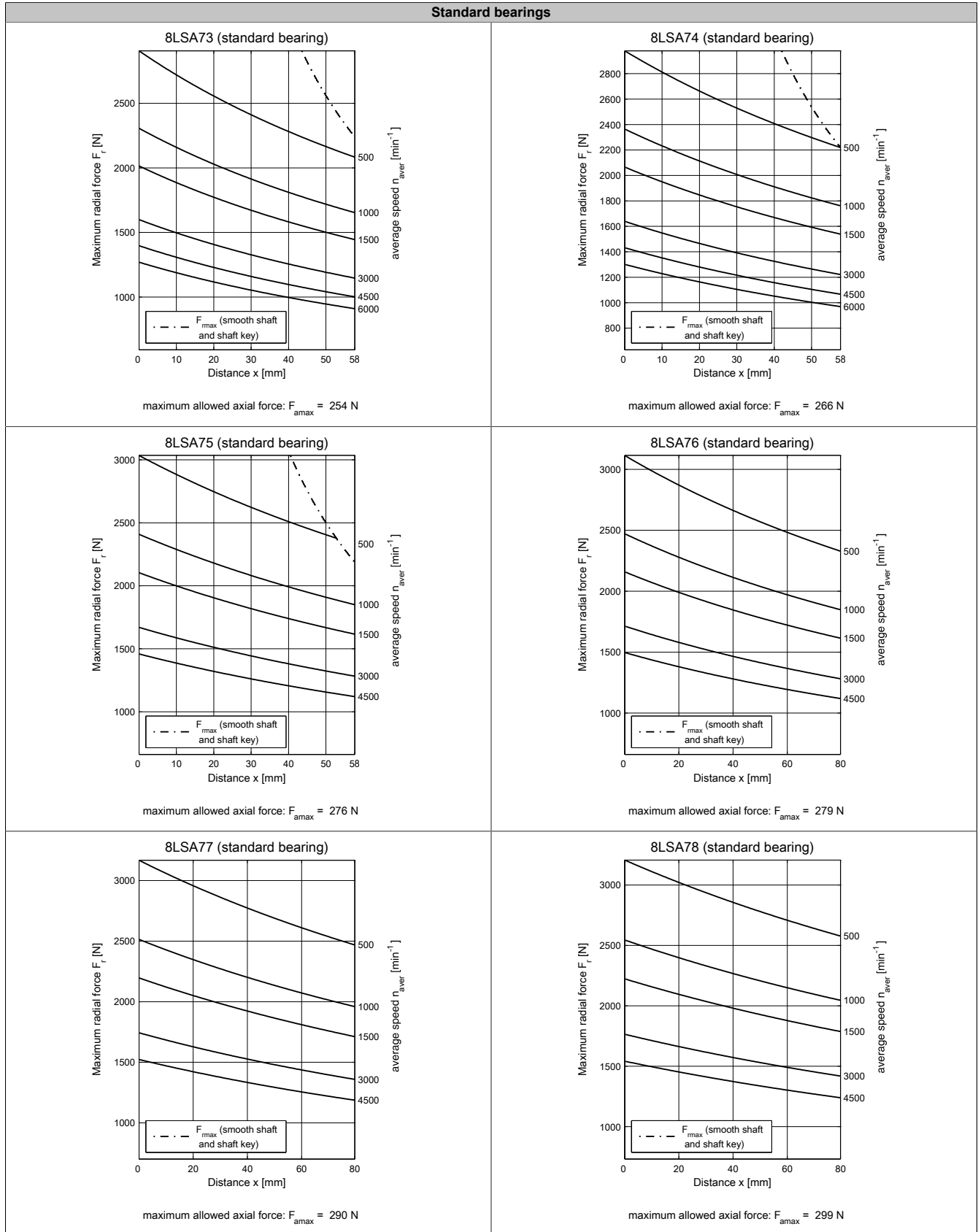
8LSC78.eennffgg-3



### 2.8.4.4 Permissible shaft load

#### 2.8.4.4.1 8LSA/C7 V3 - Permissible shaft load

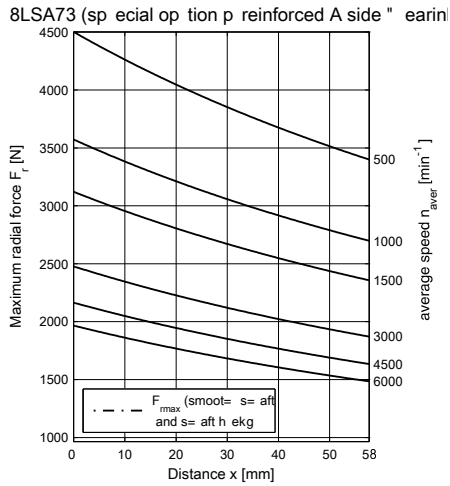
Shaft load values apply to both 8LSA and 8LSC!



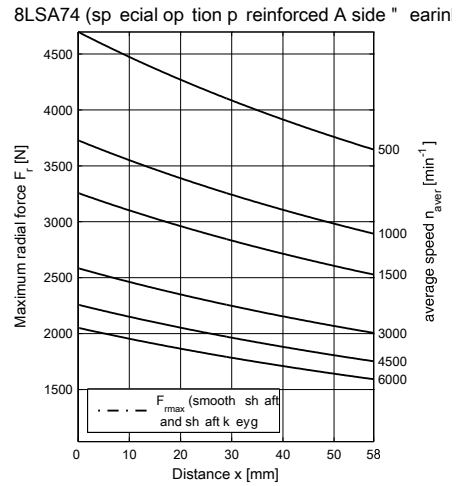
2.8.4.4.2 8LSA/C7 V3 - Permissible shaft load

Shaft load values apply to both 8LSA and 8LSC!

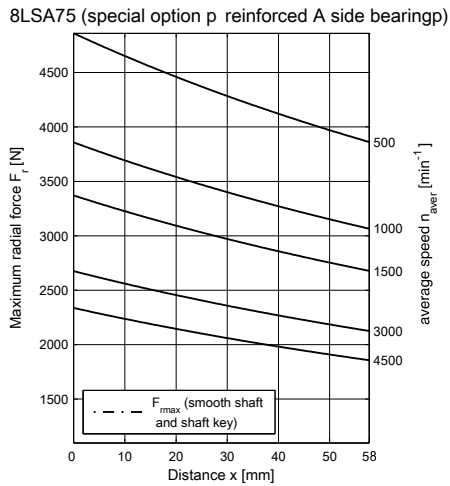
Reinforced bearings



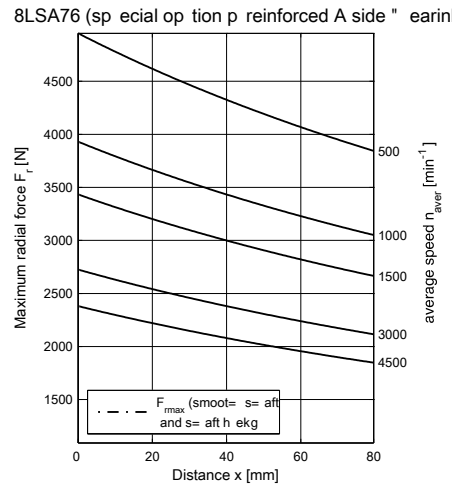
maximum allowed axial force  $F_{amax}$  : 405 N



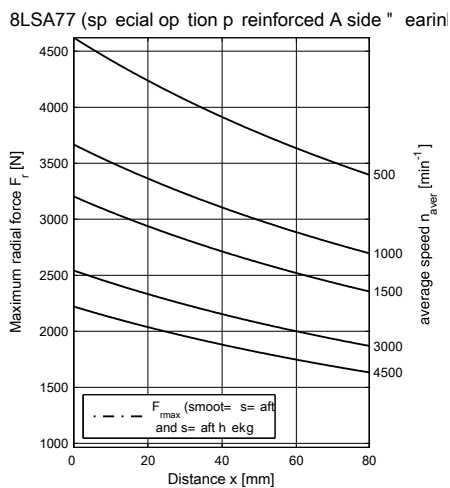
maximum allowed axial force  $F_{amax}$  : 42 N



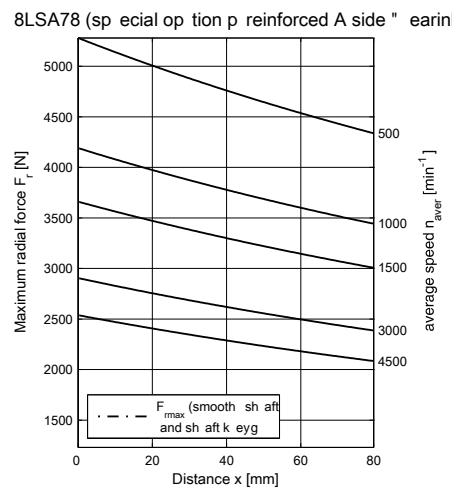
maximum allowed axial force:  $F_{amax}$  = 450 N



maximum allowed axial force  $F_{amax}$  : 453 N

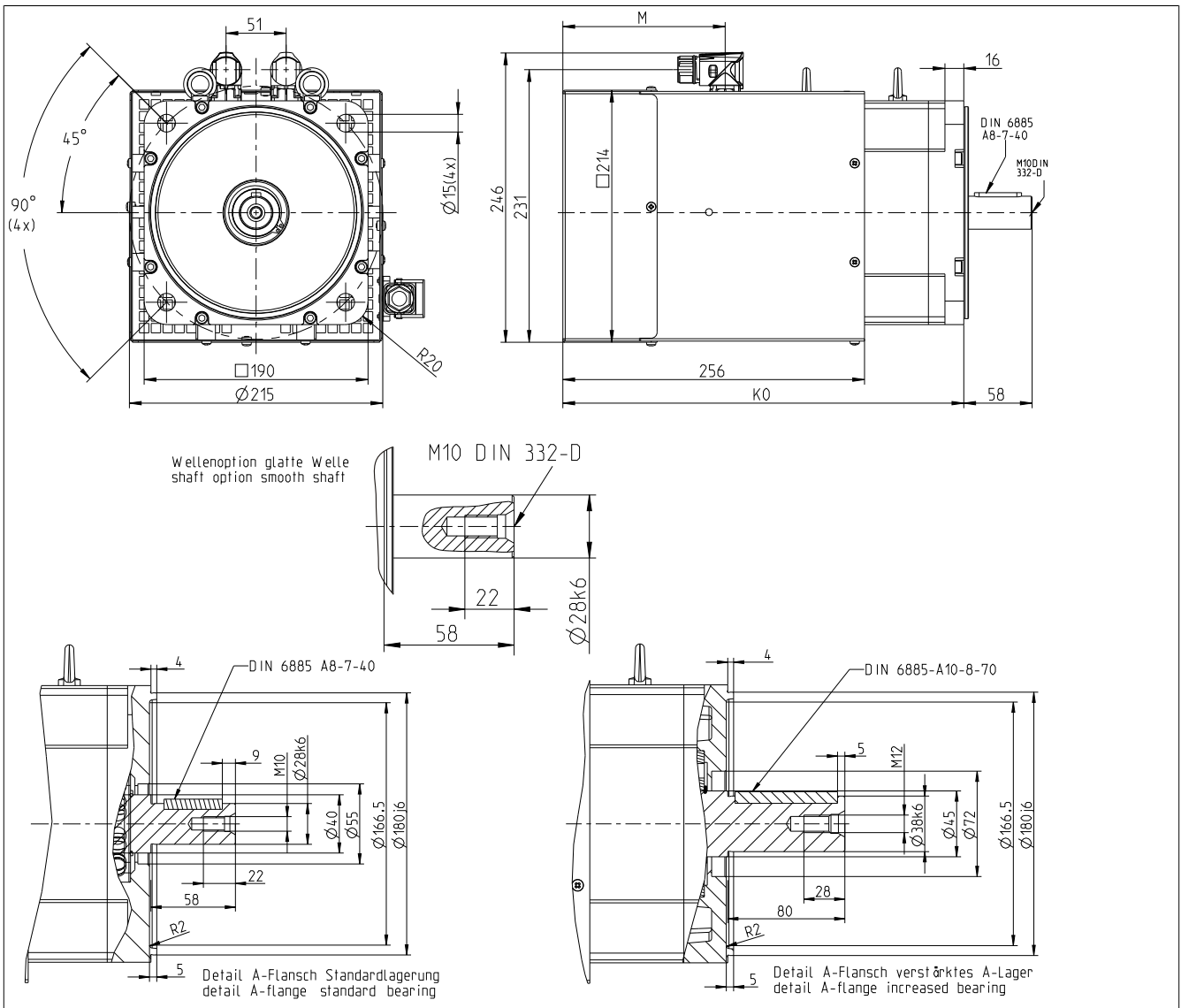


maximum allowed axial force  $F_{amax}$  : 410 N



maximum allowed axial force  $F_{amax}$  : 4= 8 N

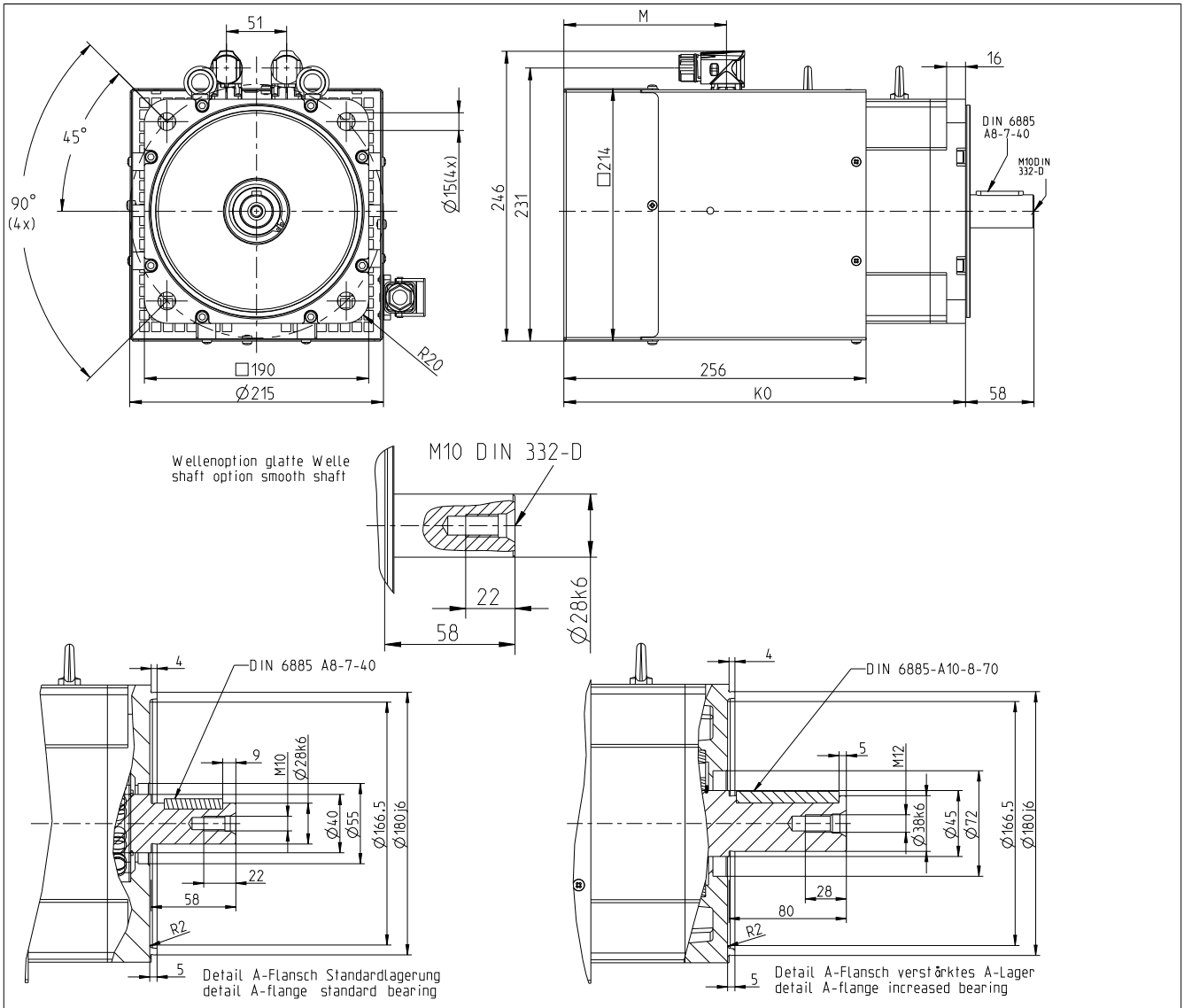
2.8.4.5 8LSC73-75 V3 - Dimensions



EnDat / resolver feedback		Extension of K <sub>0</sub> and M depending on the motor option [mm]			
Model number	K <sub>0</sub>	M	Holding brake	Heavy duty holding brake	Reinforced A side bearing
8LSC73.eennffgg-3	318	137.8	37	54	10
<b>8LSC73.ee045ffgg-3, power connector size 1.5</b>			<b>On request</b>		
8LSC74.eennffgg-3	340.5	137.8	37	54	10
<b>8LSC74.ee045ffgg-3, power connector size 1.5</b>	353.5	141.8	37	54	10
8LSC75.eennffgg-3	363.0	137.8	37	54	10
<b>8LSC75.ee045ffgg-3, power connector size 1.5</b>			<b>On request</b>		

Whether or not an oil seal is used has no effect on the length of the motor.

2.8.4.6 8LSC76-78 V3 - Dimensions



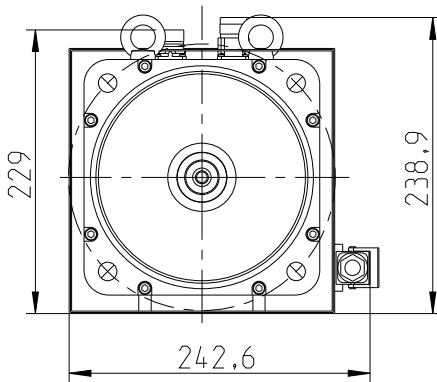
EnDat / resolver feedback	Extension of K <sub>0</sub> and M depending on the motor option [mm]				
	Model number	K <sub>0</sub>	M	Holding brake	Heavy duty holding brake
8LSC76.eennnffgg-3	421	142	37	54	10
8LSC77.eennnffgg-3	466	142	37	54	10
8LSC78.eennnffgg-3	511	142	37	54	10

Whether or not an oil seal is used has no effect on the length of the motor.

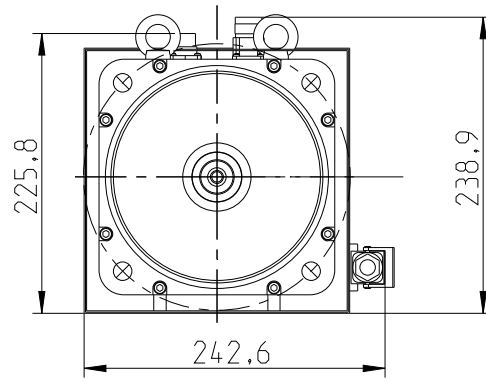
2.8.4.7 8LSC73-78 V3 - Connector options - Dimensions

Size 1

Option C

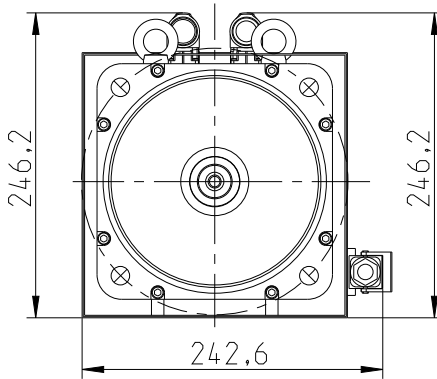


opt. E0,E1  
ind. EA,EB  
Resolver R2

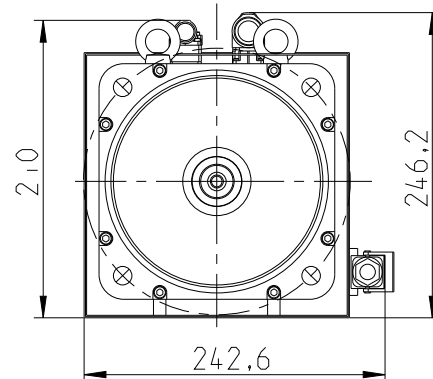


opt. D0,D1,S0,S1  
ind. DA,DB,SA,SB

Option D

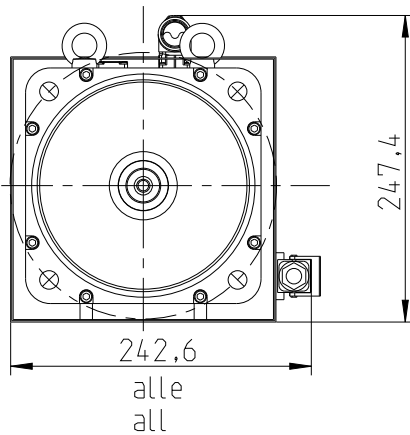


opt. E0,E1  
ind. EA,EB  
Resolver R2



opt. D0,D1,S0,S1  
ind. DA,DB,SA,SB

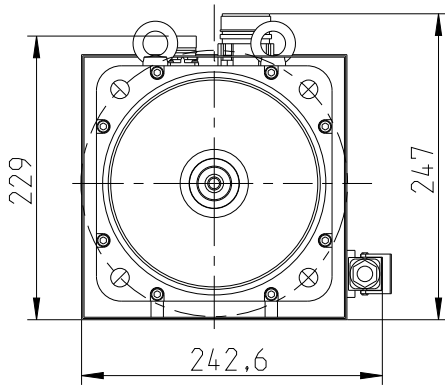
Option S



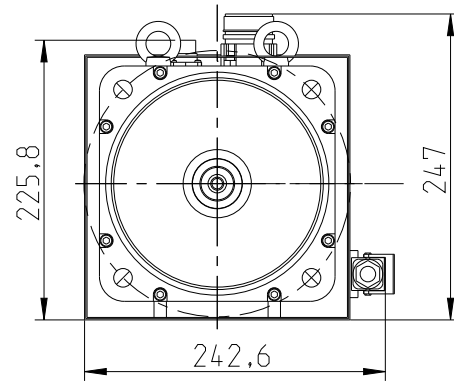
alle  
all

Size 1.5

Option C

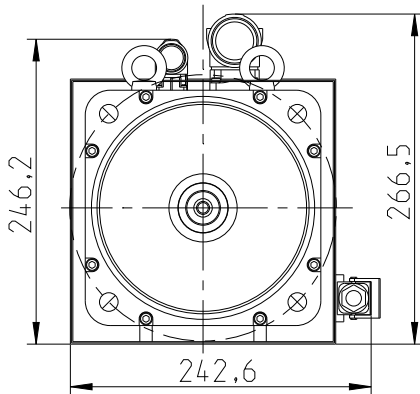


opt. E0,E1  
ind. EA,EB  
Resolver R2

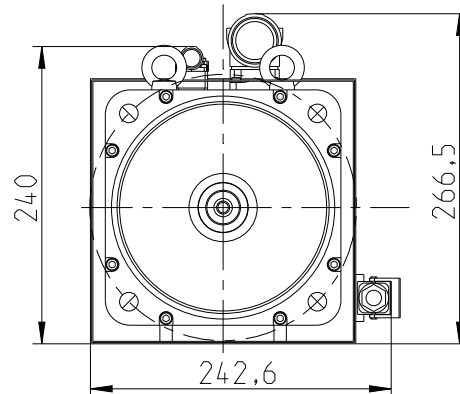


opt. D0,D1,S0,S1  
ind. DA,DB,SA,SB

Option D



opt. E0,E1  
ind. EA,EB  
Resolver R2



opt. D0,D1,S0,S1  
ind. DA,DB,SA,SB



## 2.8.5 Technical data - 8LSC8 V3

Model number	8LSC83. ee015ffgg-3	8LSC83. ee020ffgg-3	8LSC83. ee022ffgg-3	8LSC83. ee030ffgg-3	8LSC84. ee011ffgg-3	8LSC84. ee015ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	1500	2000	2200	3000	1100	1500
Number of pole pairs	3					
Nominal torque $M_N$ [Nm]	45.5	41.6	40.3	35.1	79.3	75.4
Nominal power $P_N$ [W]	7147	8713	9284	11027	9135	11844
Nominal current $I_N$ [A]	14	17	18.2	21.5	17.9	23.1
Stall torque $M_0$ [Nm]	52				89.7	
Stall current $I_0$ [A]	16	21.2	23.5	31.9	20.2	27.5
Maximum torque $M_{max}$ [Nm]	120				204	
Maximum current $I_{max}$ [A]	50	66	72.6	102	58.1	79
Maximum speed $n_{max}$ [rpm]	3600					
Torque constant $K_T$ [Nm/A]	3.26	2.45	2.22	1.63	4.43	3.26
Voltage constant $K_E$ [V/1000 rpm]	196.87	147.65	134.04	98.44	268.08	196.87
Stator resistance $R_{2ph}$ [ $\Omega$ ]	0.95	0.58	0.45	0.26	0.83	0.43
Stator inductance $L_{2ph}$ [mH]	18	13.8	10.5	6.1	25.2	15.8
Electrical time constant $t_{el}$ [ms]	18.9	23.8	23.3	23.5	30.4	36.7
Thermal time constant $t_{therm}$ [min]	50				65	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	65				114	
Mass without brake $m$ [kg]	47.7				65.7	
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	130					
Brake mass [kg]	7					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	53					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1180	1320		1640		1320
ACOPOS multi inverter module 8BVxxxx...	0220	0330		0440		0330
Cross section for B&R motor cables [mm <sup>2</sup> ]	4					
Connector type	speedtec					
Connector size	1.5					

Table 79: 8LSC83.ee015ffgg-3, 8LSC83.ee020ffgg-3, 8LSC83.ee022ffgg-3, 8LSC83.ee030ffgg-3, 8LSC84.ee011ffgg-3, 8LSC84.ee015ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

## Technical data

Model number	8LSC84. ee020ffgg-3	8LSC84. ee022ffgg-3	8LSC84. ee030ffgg-3	8LSC85. ee011ffgg-3	8LSC85. ee015ffgg-3	8LSC85. ee020ffgg-3
<b>Motor</b>						
Nominal speed $n_N$ [rpm]	2000	2200	3000	1100	1500	2000
Number of pole pairs	3					
Nominal torque $M_N$ [Nm]	68.9	66.95	62.92	106	100.1	93.6
Nominal power $P_N$ [W]	14430	15424	19767	12210	15724	19604
Nominal current $I_N$ [A]	28.1	30.2	38.6	24.2	30.7	38.2
Stall torque $M_0$ [Nm]	89.7			122.2		
Stall current $I_0$ [A]	36.6	40.5	55	27.8	37.5	49.9
Maximum torque $M_{max}$ [Nm]	204			280		
Maximum current $I_{max}$ [A]	105	115.5	171	80	113	157
Maximum speed $n_{max}$ [rpm]	3600					
Torque constant $K_T$ [Nm/A]	2.45	2.22	1.63	4.38	3.26	2.45
Voltage constant $K_E$ [V/1000 rpm]	147.65	134.04	98.44	268.08	196.87	147.65
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.27	0.22	0.12	0.66	0.328	0.168
Stator inductance $L_{zph}$ [mH]	8.9	7.4	3.9	19.1	9.44	4.85
Electrical time constant $t_{el}$ [ms]	33	33.6	32.5	28.9	28.5	28.9
Thermal time constant $t_{therm}$ [min]	65			80		
Moment of inertia $J$ [kgcm <sup>2</sup> ]	114			150		
Mass without brake $m$ [kg]	65.7			80.2		
<b>Holding brake</b>						
Holding torque of the brake $M_{Br}$ [Nm]	130					
Brake mass [kg]	7					
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	53					
<b>Recommendations</b>						
ACOPOS servo drive 8Vxxxx.xx...	1640		1320		1640	
ACOPOS multi inverter module 8BVlxxxx...	0440	0660		0330	0440	0660
Cross section for B&R motor cables [mm <sup>2</sup> ]	10		16	4	10	
Connector type	speedtec					
Connector size	1.5					

Table 80: 8LSC84.ee020ffgg-3, 8LSC84.ee022ffgg-3, 8LSC84.ee030ffgg-3, 8LSC85.ee011ffgg-3, 8LSC85.ee015ffgg-3, 8LSC85.ee020ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

Model number	8LSC86.ee015ffgg-3	8LSC86.ee020ffgg-3
<b>Motor</b>		
Nominal speed $n_N$ [rpm]	1500	2000
Number of pole pairs	3	
Nominal torque $M_N$ [Nm]	126.1	110.5
Nominal power $P_N$ [W]	19808	23143
Nominal current $I_N$ [A]	38.7	45.1
Stall torque $M_0$ [Nm]	149.5	
Stall current $I_0$ [A]	45.9	61
Maximum torque $M_{max}$ [Nm]	345	
Maximum current $I_{max}$ [A]	120	182
Maximum speed $n_{max}$ [rpm]	3600	
Torque constant $K_T$ [Nm/A]	3.26	2.45
Voltage constant $K_E$ [V/1000 rpm]	196.87	147.65
Stator resistance $R_{zph}$ [ $\Omega$ ]	0.28	0.13
Stator inductance $L_{zph}$ [mH]	8.8	3.9
Electrical time constant $t_{el}$ [ms]	31.4	30
Thermal time constant $t_{therm}$ [min]	90	
Moment of inertia $J$ [kgcm <sup>2</sup> ]	192	
Mass without brake $m$ [kg]	93.7	
<b>Holding brake</b>		
Holding torque of the brake $M_{Br}$ [Nm]	130	
Brake mass [kg]	7	
Moment of inertia for the brake $J_{Br}$ [kgcm <sup>2</sup> ]	53	
<b>Recommendations</b>		
ACOPOS servo drive 8Vxxx.xx...	1640	128M
ACOPOS multi inverter module 8BVlxxx...	0660	0880
Cross section for B&R motor cables [mm <sup>2</sup> ]	10	16
Connector type	speedtec	
Connector size	1.5	

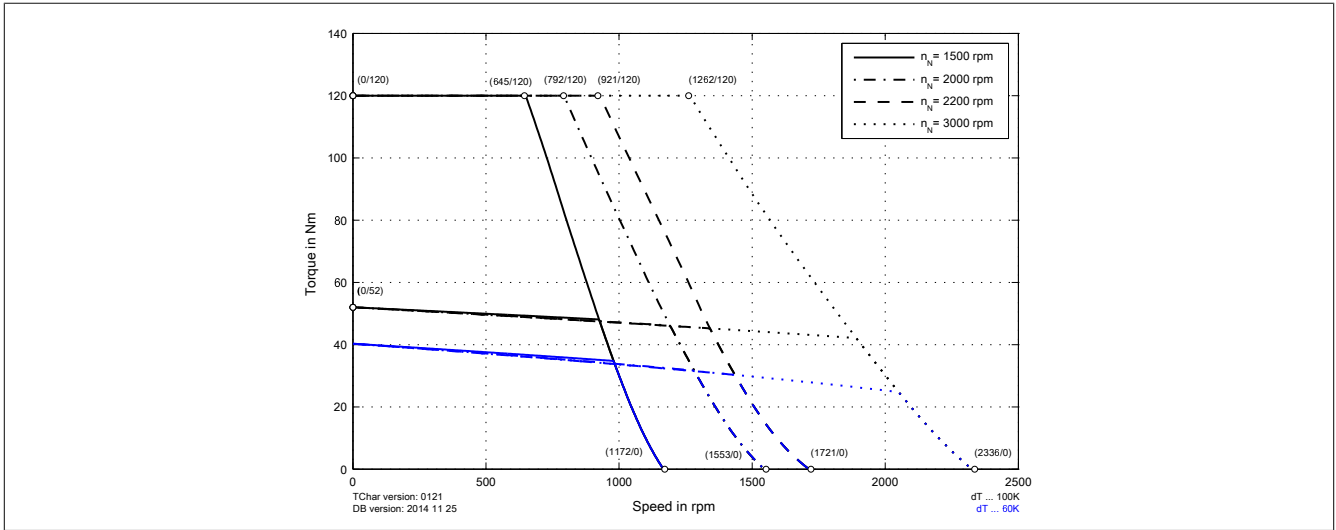
Table 81: 8LSC86.ee015ffgg-3, 8LSC86.ee020ffgg-3 - Technical data

**NOTE – Servo drive:** The recommended servo drive / inverter module is designed for 1.1x the stall current. If more than double the amount is needed during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline; detailed inspection of the corresponding speed/torque characteristic curve can result in deviations of the servo drive size (larger or smaller).

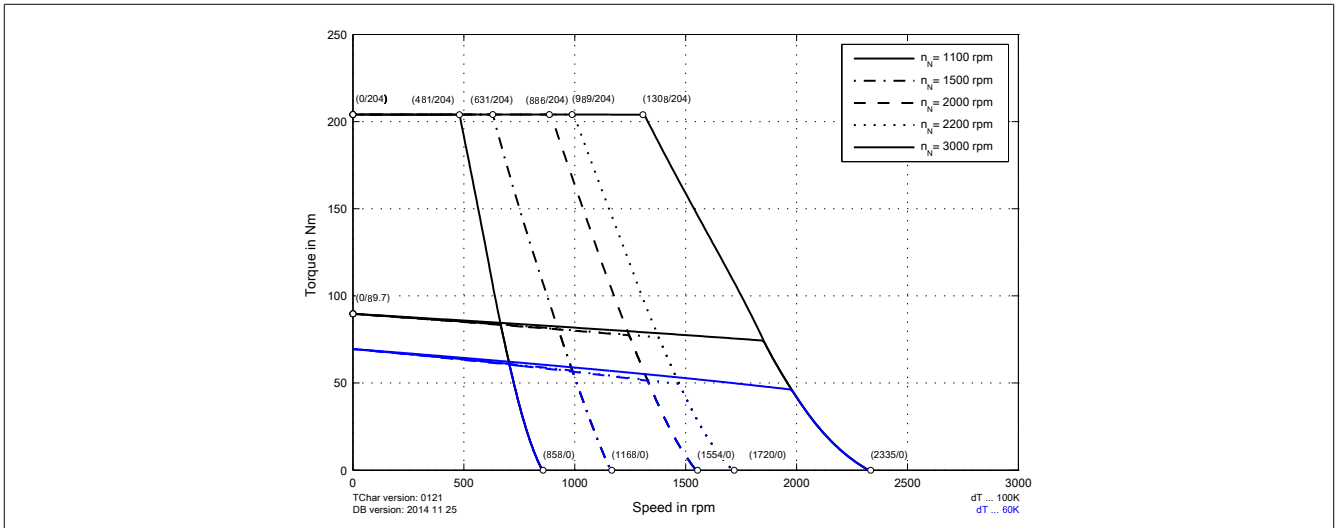
**NOTE – Cable cross section:** The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the ACOPOS servo drive or the recommended ACOPOS inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request. Note the type of wiring.

### 2.8.5.1 Speed-torque characteristics at DC bus voltage of 325 VDC

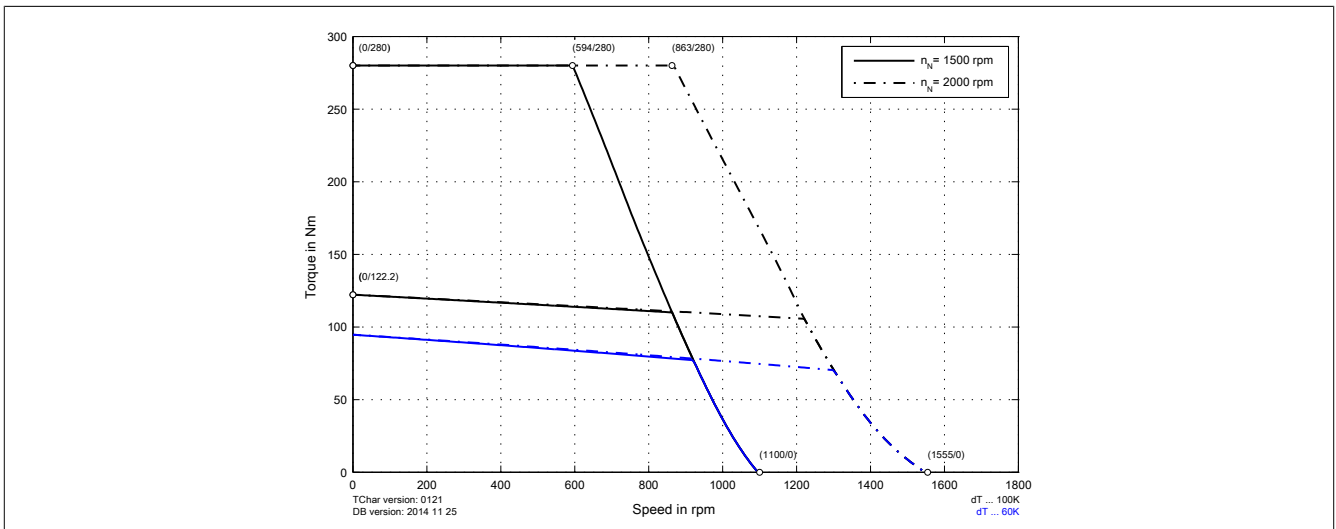
#### 8LSC83.eennffgg-3



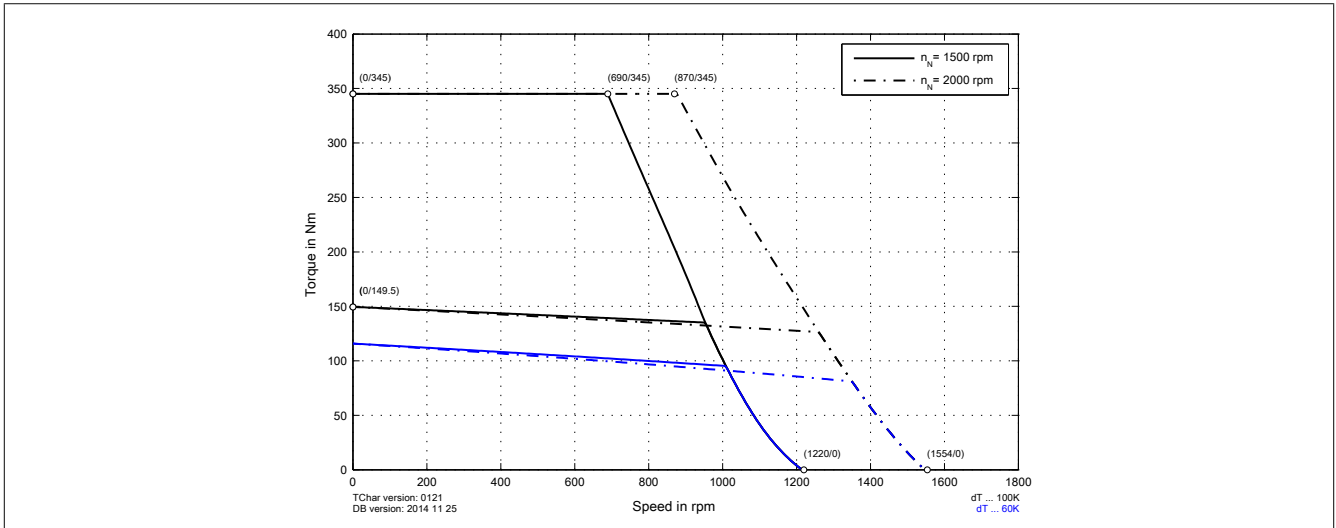
#### 8LSC84.eennffgg-3



#### 8LSC85.eennffgg-3

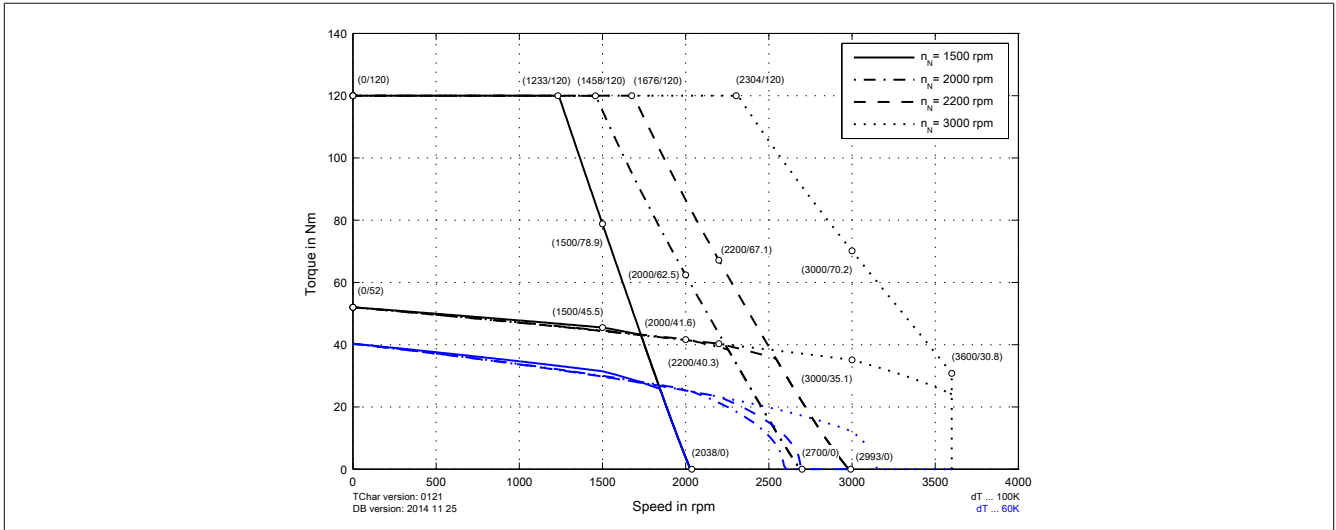


8LSC86.eennffgg-3

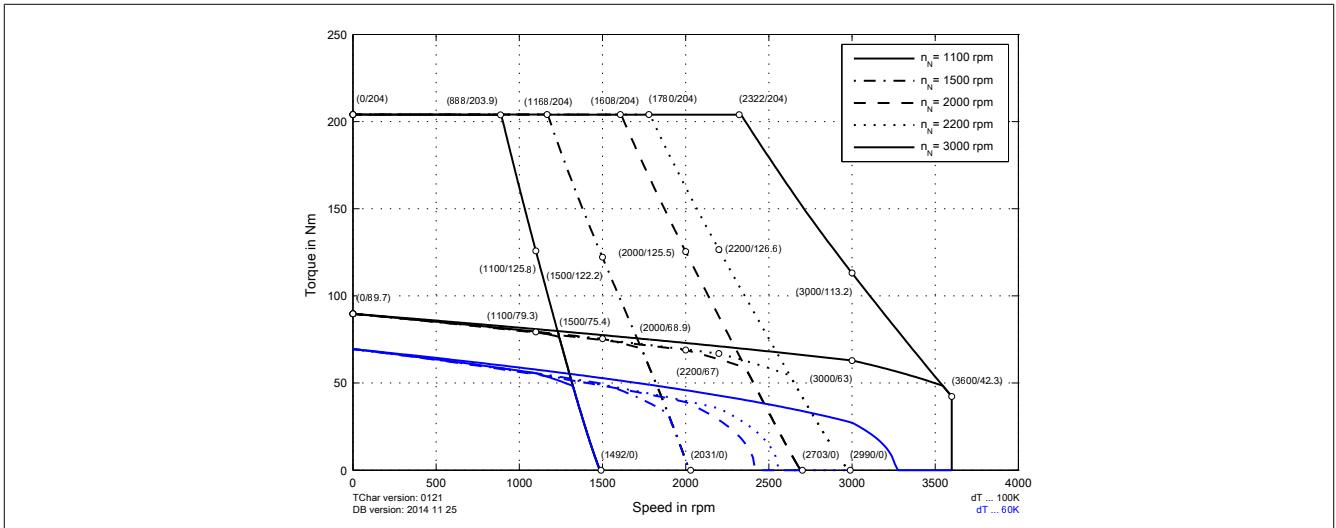


### 2.8.5.2 Speed-torque characteristics at DC bus voltage of 560 VDC

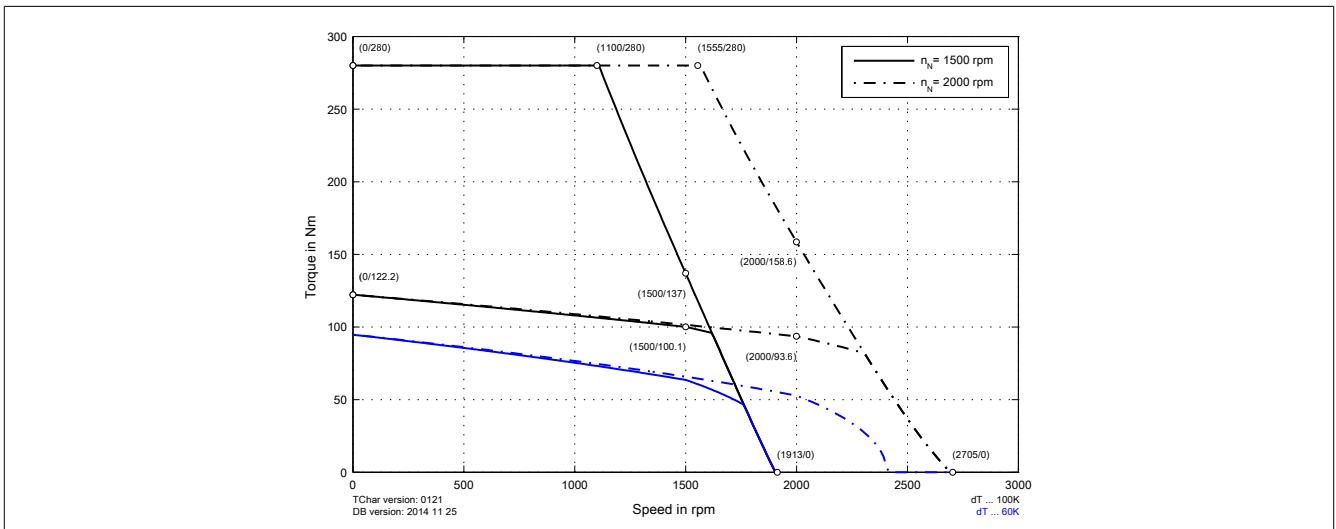
#### 8LSC83.eennffgg-3



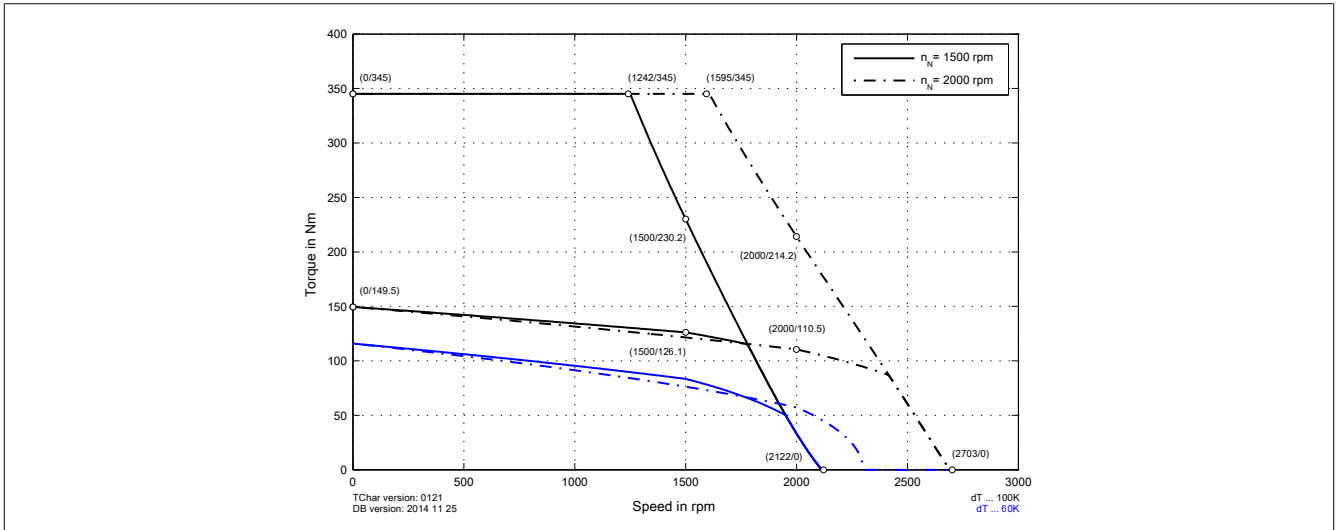
#### 8LSC84.eennffgg-3



#### 8LSC85.eennffgg-3

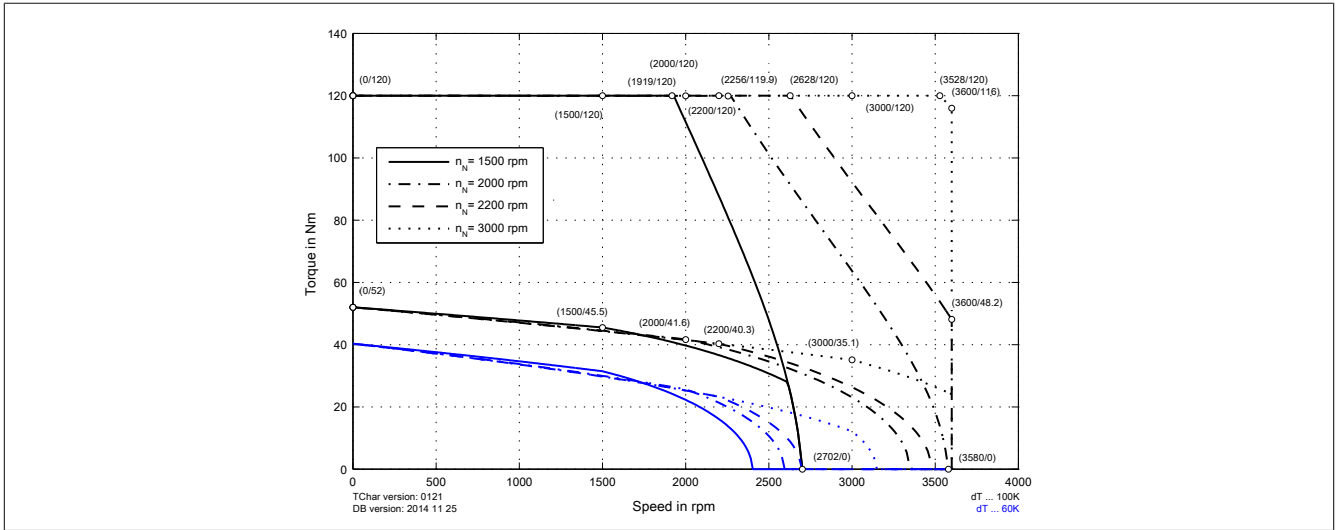


8LSC86.eennffgg-3

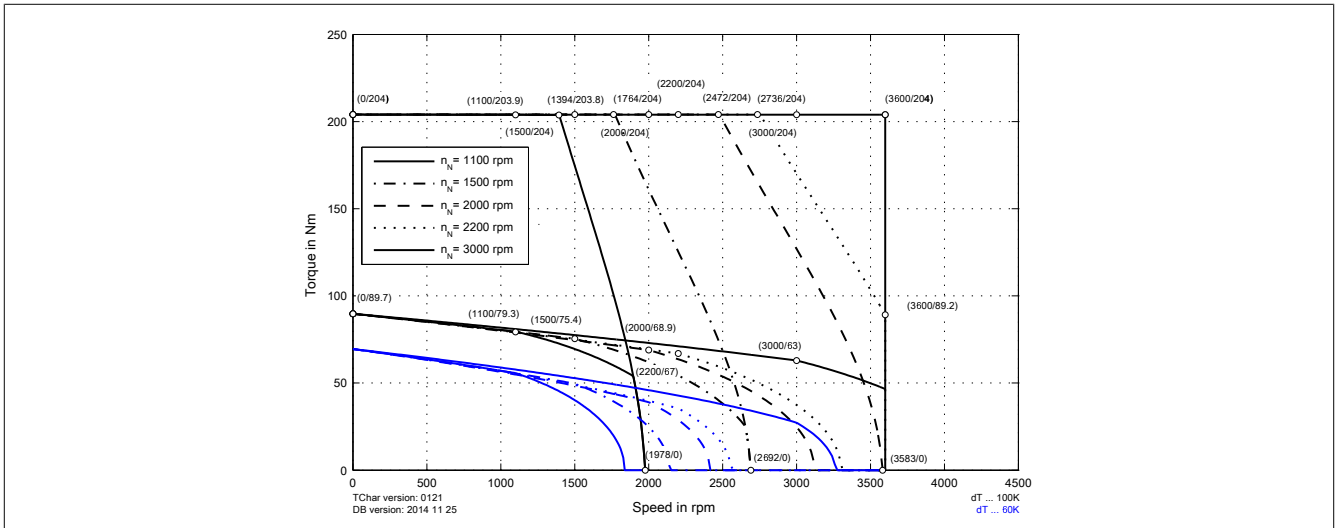


### 2.8.5.3 Speed-torque characteristics at DC bus voltage of 750 VDC

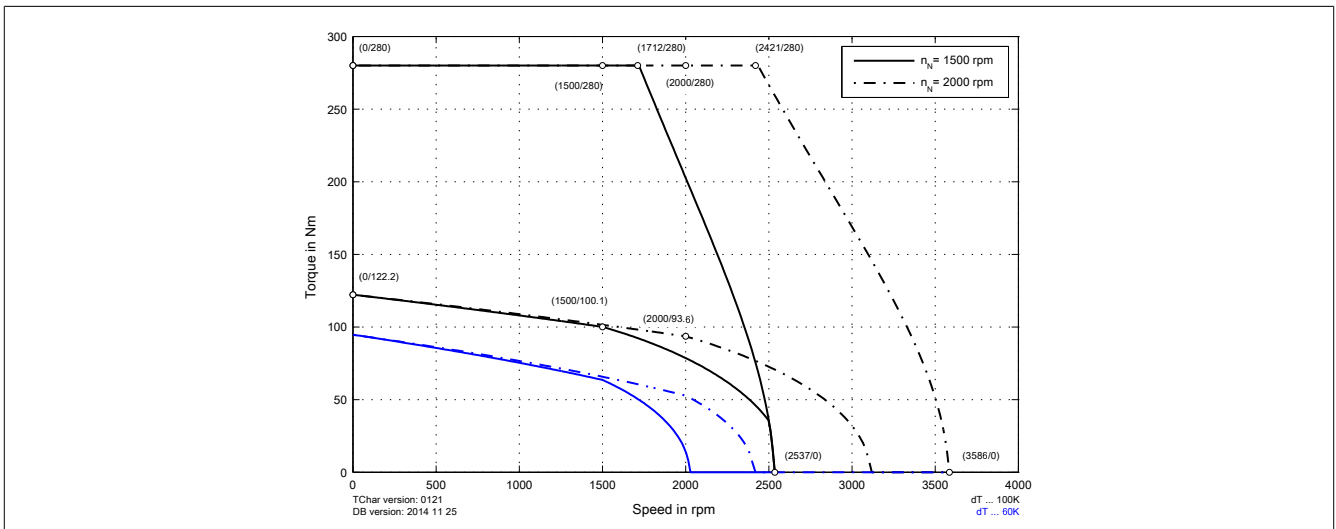
#### 8LSC83.eennffgg-3



#### 8LSC84.eennffgg-3

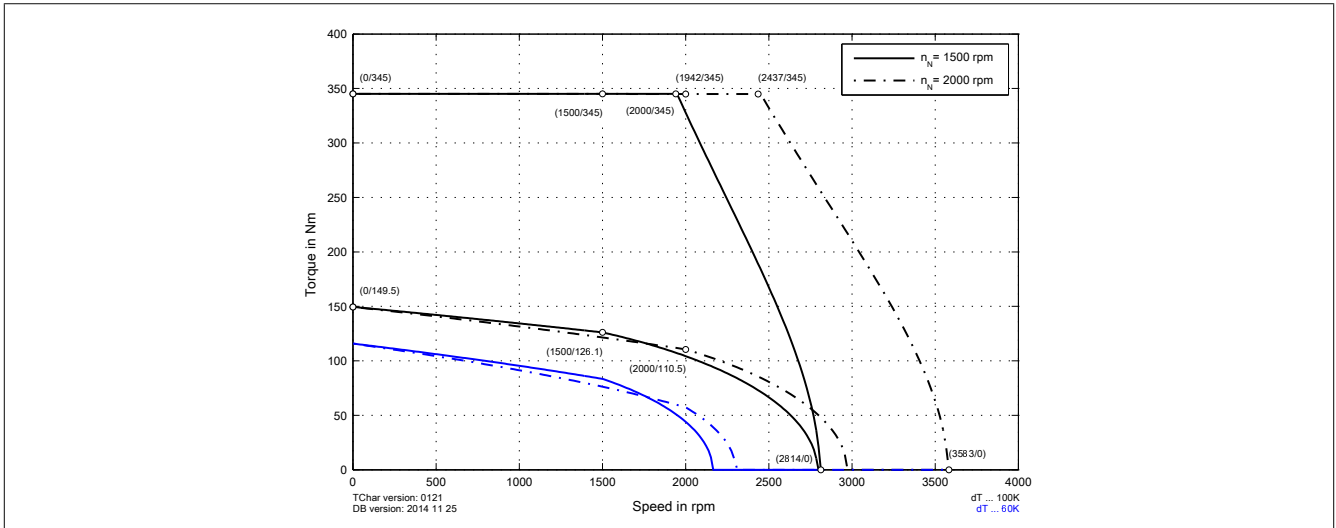


#### 8LSC85.eennffgg-3





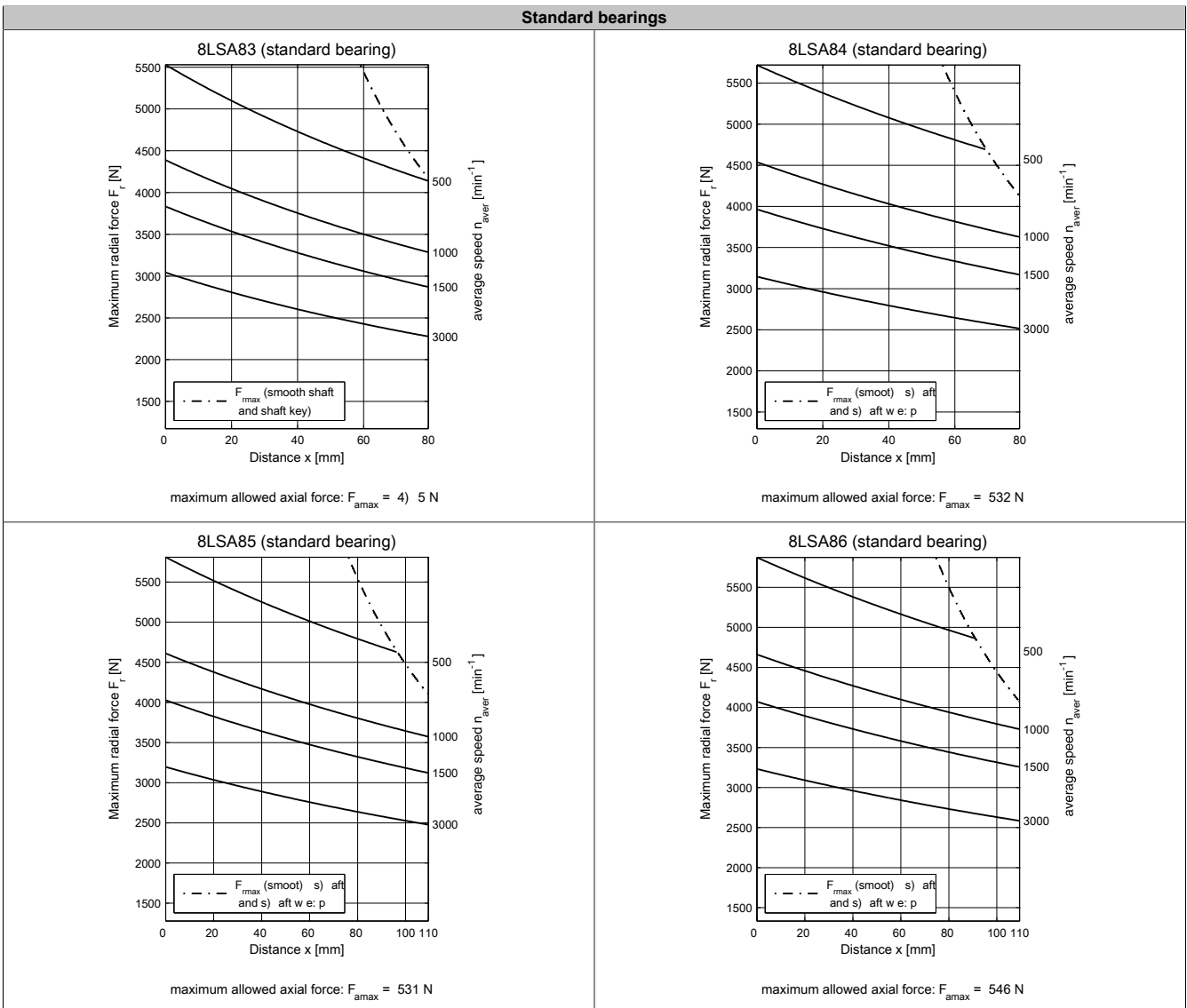
8LSC86.eennffgg-3



2.8.5.4 Permissible shaft load

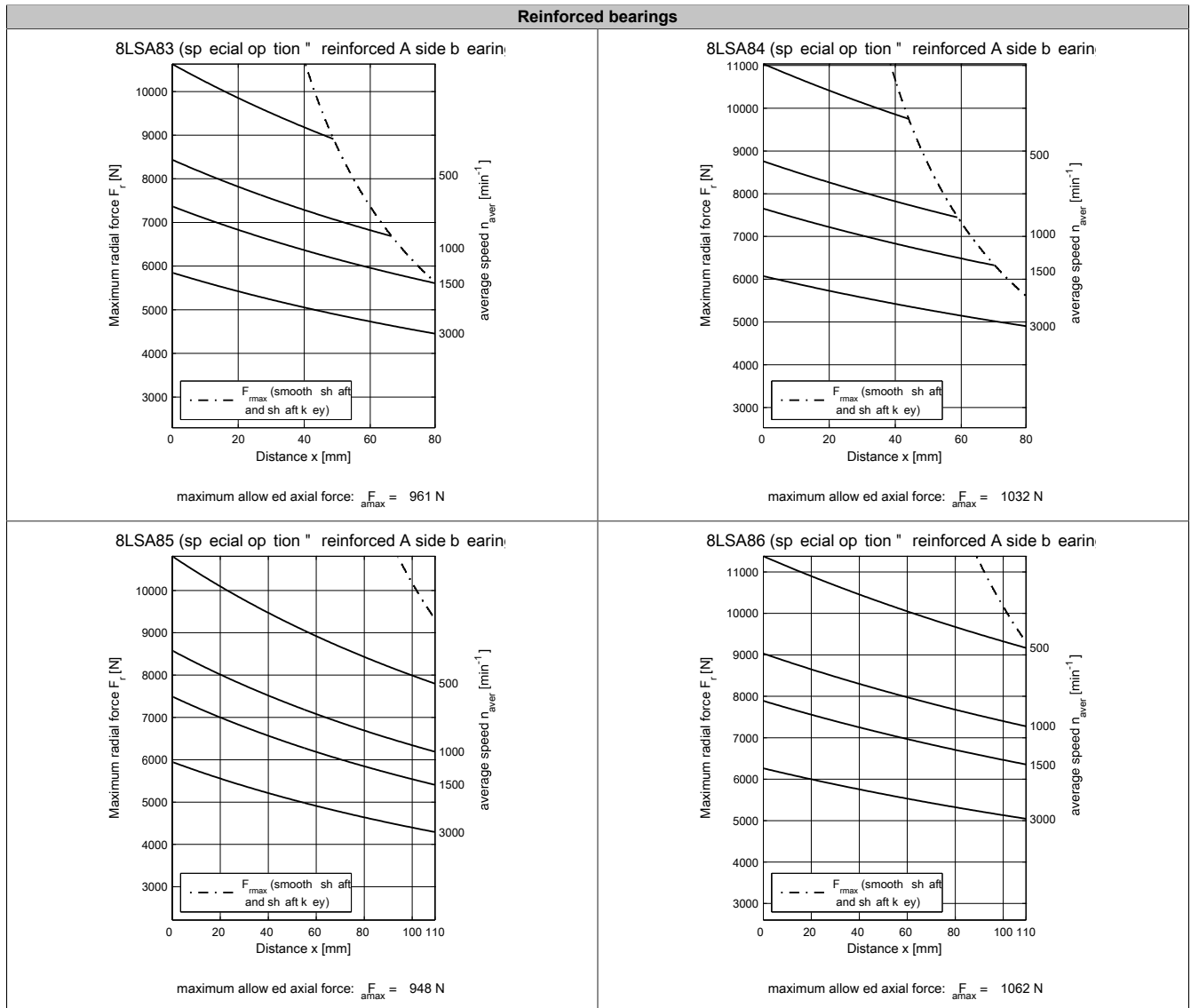
2.8.5.4.1 8LSA/C8 V3 - Permissible shaft load (standard bearing)

Shaft load values apply to both 8LSA and 8LSC!

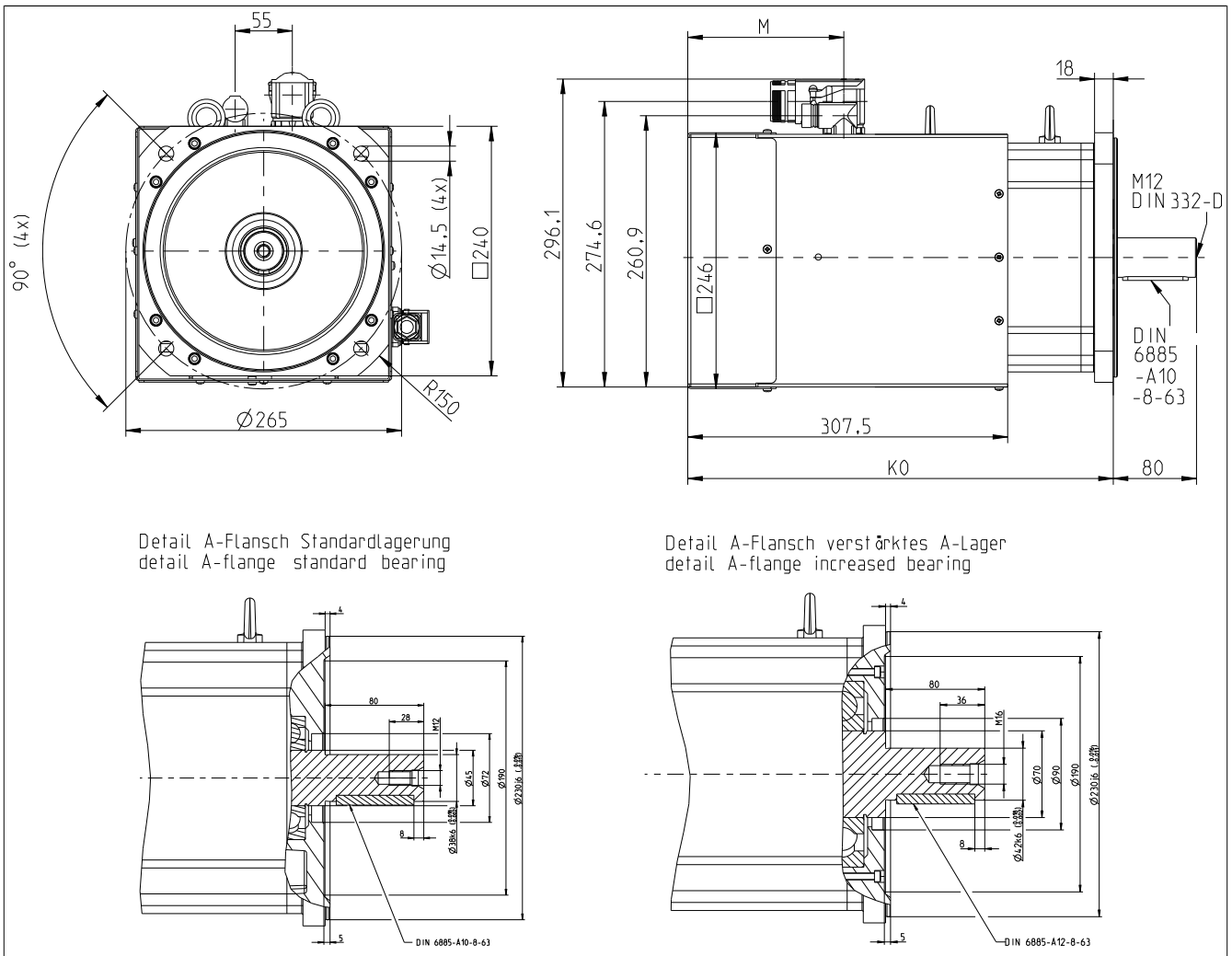


### 2.8.5.4.2 8LSA/C8 V3 - Permissible shaft load (reinforced bearing)

Shaft load values apply to both 8LSA and 8LSC!

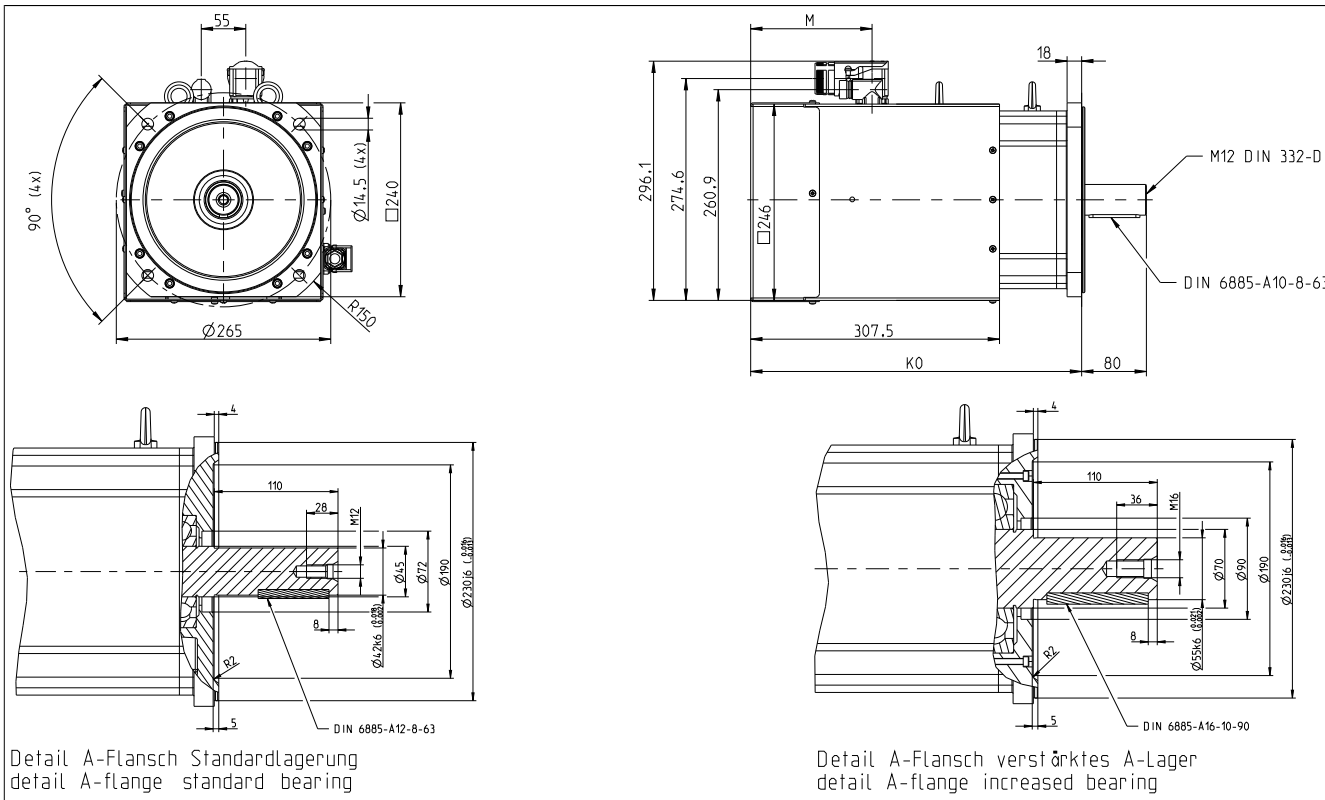


2.8.5.5 8LSC8 V3 - Dimensions



EnDat feedback / Resolver feedback			Extension of K <sub>0</sub> depending on motor option [mm]		
Model number	K <sub>0</sub>	M	Holding brake <sup>1)</sup>	Oil seal	Reinforced A side bearing
8LSC83.eennffgg-3	409	150	50	---	16.5
8LSC84.eennffgg-3	489	150	50	---	16.5

<sup>1)</sup> The motor option "holding brake" cannot be ordered in combination with special motor option "Reinforced A-side bearing".



Detail A-Flansch Standardlager  
detail A-flange standard bearing

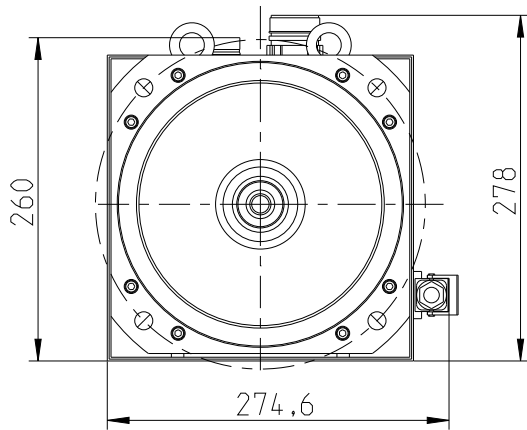
Detail A-Flansch verstärktes A-Lager  
detail A-flange increased bearing

EnDat feedback / Resolver feedback Model number	Extension of K <sub>0</sub> depending on motor option [mm]				
	K <sub>0</sub>	M	Holding brake <sup>1)</sup>	Oil seal	Reinforced A side bearing
8LSC85.eennnfgg-3	549	150	50	---	16.5
8LSC86.eennnfgg-3	609	150	50	---	16.5

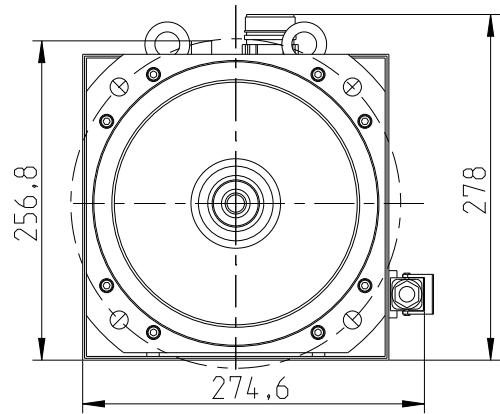
<sup>1)</sup> The motor option "holding brake" cannot be ordered in combination with special motor option "Reinforced A-side bearing".

2.8.5.5.1 8LSC8 V3 - Connector options - Dimensions

Option C

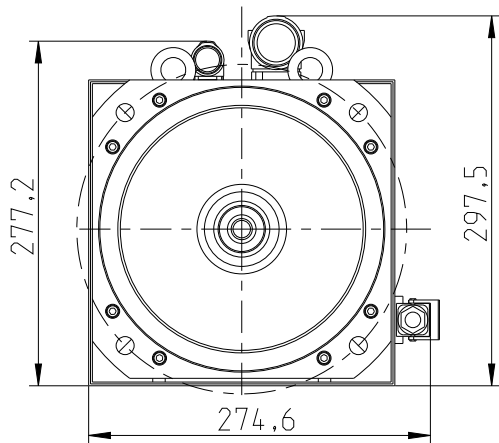


opt. E0,E1  
ind. EA,EB  
Resolver R2

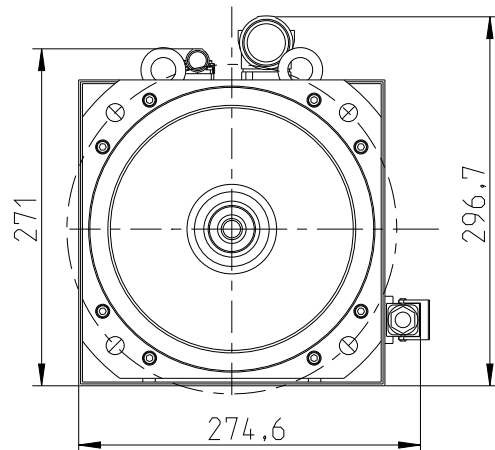


opt.D0,D1,S0,S1  
ind. DA,DB,SA,SB

Option D



opt. E0,E1  
ind. EA,EB  
Resolver R2



opt.D0,D1,S0,S1  
ind. DA,DB,SA,SB

## 2.8.6 Technical data - Fans

### 2.8.6.1 24 V fan (standard)

#### Overview

The fan components used depend on the size.

Fan	for motor		
	8LSC4	8LSC5 and 8LSC6	8LSC7 and 8LSC8
Manufacturer	ebm-papst	ebm-papst	ebm-papst
Manufacturer's product ID	4184 NXH	7114 N	6424 M
Operating voltage 24 VDC			

#### Technical data

General information	24 VDC fan		
Manufacturer's product ID	4184 NXH	7114 N	6424 M
C-UR-US listed	Yes	Yes	Yes
Fan type	DC fan with electronically commutated external rotor motor	DC fan with electronically commutated external rotor motor	DC fan with electronically commutated external rotor motor
Rotor bearings	Ball bearings	Ball bearings	Ball bearings
Protection	IP20	IP20	IP20
Nominal voltage	24 VDC +16% / -50%	24 VDC +25% / -50%	24 VDC +33% / -50%
Power consumption	11 W	12 W	12 W
Overload protection	Protected against blocking and overloading by PTC resistor; Partially impedance protected	Protected against blocking and overloading by PTC resistor; Partially impedance protected	
Temperature range	-30 ... +70°C	-25 ... +72°C	-20 ... +55°C
Operating noise	57 dB(A)	53 dB(A)	52 dB(A)
Service life			
At 40°C	70000 h	80000 h	80000 h
At max. permissible temperature	35000 h	37500 h	37500 h

### 2.8.6.2 230 VAC fan

#### Overview

The fan components used depend on the size.

Fan	for motor		
	8LSC4	8LSC5 and 8LSC6	8LSC7 and 8LSC8
Manufacturer	ebm-papst		ebm-papst
Manufacturer's product ID			
Operating voltage 220 VDC	3656 ZP		7450 ES

#### Technical data

General information	230 VAC fan	
Manufacturer's product ID	3656 ZP	7450 ES
C-UR-US listed	Yes	Yes
Fan type	AC fan with external rotor shaded-pole motor	AC fan with external rotor shaded-pole motor
Rotor bearings	Ball bearings	Ball bearings
Protection	IP20	IP20
Nominal voltage	230 VAC	230 VAC
Power consumption	12 W	47 W
Overload protection	Impedance protected	Thermal switches
Temperature range	-40 ... +75°C	-25 ... +60°C
Operating noise	37 dB(A)	60 dB(A)
Service life		
At 40°C	52500 h	63000 h
At max. permissible temperature	22500 h	50000 h

## 3 Installation conditions

Operating conditions		
Rating class, operating mode in accordance with EN 60034-1	S1 - Continuous operation	S1 - Continuous operation
Ambient temperature during operation	-15°C to +40°C	-15°C to +40°C
Reduction of the nominal current and stall current at temperatures above 40°C	10% per 10°C	10% per 10°C
Maximum ambient temperature during operation	+55°C <sup>1)</sup>	+55°C <sup>1)</sup>
Reduction of the nominal current and stall current at installation elevations over 1000 m above sea level	10% per 1000 m	10% per 1000 m
Maximum installation elevation	2000 m <sup>2)</sup>	2000 m <sup>2)</sup>
Maximum flange temperature	65°C	65°C
EN 60034-5 protection (IP code) With optional oil seal (DIN 3760)	IP64 IP65	IP64, fan IP20 IP65, fan IP20
Construction and mounting arrangement type in accordance with EN 60034-7 (IM code)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)

<sup>1)</sup> Continuous operation of the servo motors at ambient temperatures from +40°C to max. +55°C is possible but results in a shorter lifespan.

<sup>2)</sup> Requirements that go beyond this must be arranged with B&R.

### 3.1 Free convection

#### Caution!

- Free convection on the motor housing must be guaranteed!
- In the case of motors cooled by external fans, it must be ensured that warm exhaust air cannot be drawn back into the intake!

### 3.2 Damaged servo motor

#### Warning!

- Never install a damaged servo motor.
- Never operate a damaged servo motor.
- Never install a servo motor in a damaged machine.
- Before installation, ensure that the servo motor is suitable for your machine.

## 4 Installation and connection

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### 4.1 General information

#### 4.1.1 Installation on the cooling surface

8LS servo motors must be mounted on their cooling surface (the flange).

#### 4.1.2 Load capacity of the shaft end and bearing

8LS three-phase synchronous motors are equipped with grooved ball bearings which are sealed on both sides and greased. Radial and axial forces ( $F_r$ ,  $F_a$ ) applied to the shaft end during operation and installation must be within the specifications listed below. Bearing elements may not be subjected to shocks or impacts! Incorrect handling will reduce the service life and result in damage to the bearings.

##### Radial force

The radial force  $F_r$  on the shaft end is a function of the loads during installation (e.g. belt tension on pulleys) and operation (e.g. load torque on the pinion). The maximum radial force  $F_r$  depends on the shaft end type, bearing type, average speed, the position where the radial force is applied and the desired service life of the bearings.

##### Axial force, shift in shaft position caused by axial force

The axial force  $F_a$  on the shaft end is a function of the loads during installation (e.g. stress caused by mounting) and operation (e.g. thrust caused by slanted tooth pinions). The maximum axial force  $F_a$  depends on the bearing type and the desired lifespan of the bearings. The fixed bearing is secured on the A flange with a retaining ring. The floating bearing is preloaded on the B flange with a spring in the direction of the A flange. Axial forces in the direction of the B flange can cause the spring bias to be overcome, which shifts the shaft by the amount of axial backlash in the bearing (approx. 0.1 - 0.2 mm). This shift can cause problems on motors with holding brakes or all motors with inductive encoder systems. As a result, no axial force in excess of the calculated values is permitted in the direction of the B flange when using these motors. (see "Determining permissible values for  $F_r$  and  $F_a$ ")

Axial loads are not permitted on shaft ends of motors with holding brakes. It is especially important to prevent axial forces in the direction of the B flange since these forces can cause the brake to fail!

##### Determining permissible values for $F_r$ and $F_a$

Information regarding determination of permissible values for  $F_r$  and  $F_a$  can be taken from the motor data for the respective three-phase synchronous motors (see section "Radial force diagram"). Permissible values are based on a bearing lifespan of 20,000 h (bearing lifespan calculation based on DIN ISO 281).

### 4.2 Safety guidelines

#### 4.2.1 Before installation

##### **Warning!**

Never install a damaged servo motor.

Never operate a damaged servo motor.

Never install a servo motor in a damaged machine.

Before installation, ensure that the servo motor is suitable for your machine.



#### 4.2.2 No direct mains connection

##### **Warning!**

B&R's three-phase synchronous motors are not permitted to be connected directly to the power mains, they are only permitted to be operated in combination with ACOPOS servo drive systems!

#### 4.2.3 Free convection

##### **Caution!**

- Free convection on the motor housing must be guaranteed!
- In the case of motors cooled by external fans, it must be ensured that warm exhaust air cannot be drawn back into the intake!

#### 4.2.4 No shocks or impacts

##### **Caution!**

Bearing elements must not be subjected to shocks or impacts! Incorrect handling will reduce the service life and result in damage to the bearings.

#### 4.2.5 Axial forces

##### **Warning!**

Excessive axial forces on the motor shaft during installation can damage the bearings and weaken the motor holding brake until the braking effect is reduced or nonexistent. Encoder errors can also occur.

Therefore, excessive pressure or shocks to the front shaft end or the rear housing cover should be avoided under all circumstances.

The blow of a hammer certainly exceeds the permissible thresholds!

##### **Caution!**

The eye bolts included in delivery are intended exclusively for lifting the motor without any additional components installed!

#### 4.2.6 Connecting and disconnecting the servo motor

##### **Caution!**

When connecting or disconnecting the servo motor, always adhere to the following connection order:

###### Connecting

- First connect the power connector
- Then connect the encoder connector

###### Disconnecting

- First disconnect the encoder connector
- Then disconnect the power connector

### 4.3 Power connector and encoder connector

#### 4.3.1 Pinout - 8LS

##### 4.3.1.1 Pinout - Power connector

###### Built-in connector, size 1

	1	U	Motor connection U
	4	V	Motor connection V
	3	W	Motor connection W
	2	PE	Grounding
	A	T+	Temperature +
	B	T-	Temperature -
	C	B+	Brake +
	D	B-	Brake -

###### Built-in connector size 1.5

	U	U	Motor connection U
	V	V	Motor connection V
	W	W	Motor connection W
	Ground symbol	PE	Grounding
	1	T+	Temperature +
	2	T-	Temperature -
	+	B+	Brake +
	-	B-	Brake -

##### 4.3.1.2 Pinout - Resolver

	Pin	Color (LTN)	Description
	1	---	---
	2	---	---
	3	Blue	S4
	4	Red	S1
	5	Black/White	R2
	6	---	---
	7	Yellow	S2
	8	Black	S3
	9	Red/White	R1
	10	---	---
	11	---	---
12	---	---	

##### 4.3.1.3 Pinout - EnDat connections

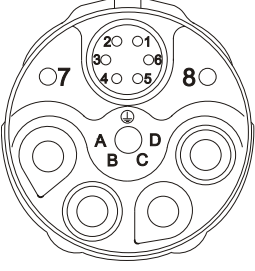
###### EnDat 2.1

	1	Blue	Sense +5 V	Sense output +5V
	2	---	---	---
	3	---	---	---
	4	White	Sense COM	Sense output 0V
	5	---	---	---
	6	---	---	---
	7	Brown/Green	+5 V output / 0.25 A	Encoder supply +5 V
	8	Purple	T	Clock input
	9	Yellow	T\	Clock input inverted
	10	White/Green	COM (1,3-9,11,13,-15)	0 V encoder supply
	11	---	---	---
	12	Blue/Black	B	Channel B
	13	Red/Black	B\	Channel B inverted
	14	Gray	D	Data output
	15	Green/Black	A	Channel A
	16	Yellow/Black	A\	Channel A inverted
	17	Pink	D\	Data inverted

**EnDat 2.2**

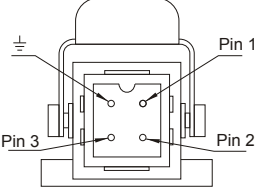
	1	Brown/Green	+5 V output / 0.25 A	+5 V encoder supply
	2	Gray	D	Data output
	3	Pink	D\	Data output, inverted
	4	Purple	T	Clock input
	5	Yellow	T\	Clock input inverted
	6	White	Sense COM	Sense 0V
	7	White/Green	COM ( 1, 3-9, 11, 13-15)	Sense +5 V
	8	---	---	---
	9	---	---	---
	10	---	---	---
	11	---	---	---
	12	Blue	Sense +5 V	Battery +5 V

**4.3.1.4 Pinout - Single-cable (hybrid) connection**

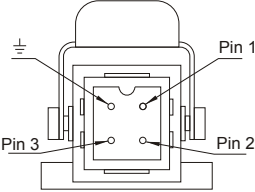
	Pin	Signal	Color
	A	--	U
	B	--	V
	C	--	W
	D	--	--
	7	--	Brake -
	8	--	Brake +
	PE	Grounding	Grounding
	1	Brown/Green	Up
	2	Gray/White	Ground
	3	Gray	Data
	4	Pink	Data
	5	Purple	Clock input
6	Yellow	Clock input inverted	

**4.3.1.5 Pinout - Fan connector**

**24 V**

	Pin	Name	Function
	1	Fan connector -	Ground
	2	--	--
	3	Fan connector +	24 VDC
	4	--	--

**230 V**

	Pin	Name	Function
	1	N	230 VAC
	2	L1	230 VAC
	3	--	--
	Ground symbol	PE	Grounding

### 4.3.2 Detailed dimensions

#### 4.3.2.1 Cable bend radius

For the exact cable bend radius values, see the corresponding cable specifications.

#### 4.3.2.2 Outer dimensions of connectors

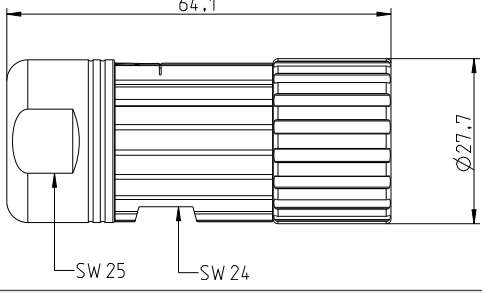
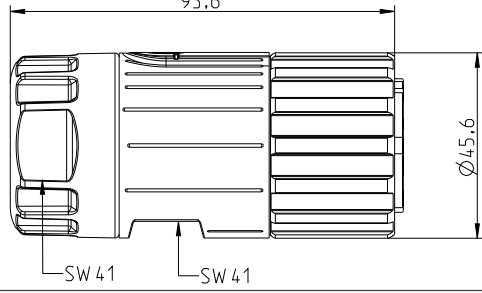
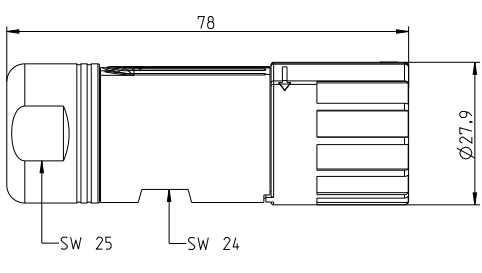
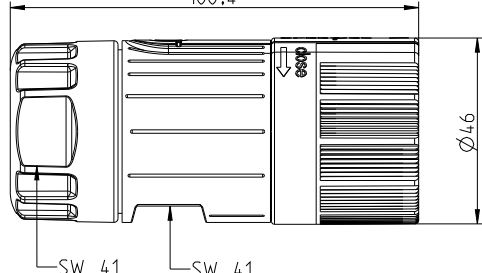
<p><b>Power connector size 1, screwed</b></p> 	<p><b>Power connector size 1.5, screwed</b></p> 
<p><b>Size 1, speedtec</b></p> 	<p><b>Size 1.5, speedtec</b></p> 

Table 82: Outer dimensions of connectors

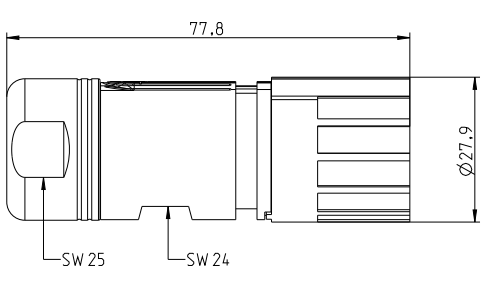
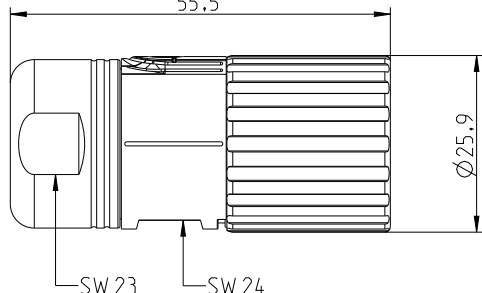
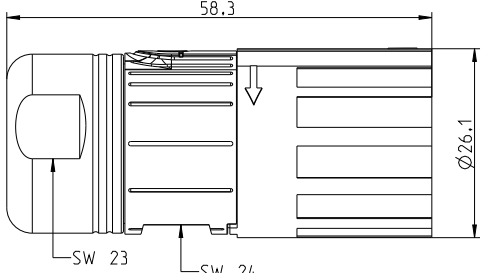
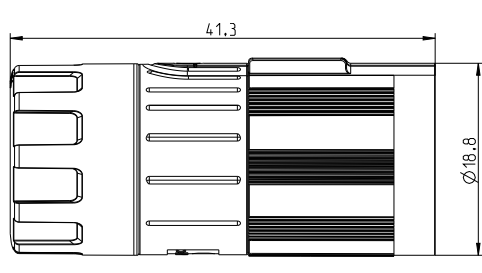
<p><b>Connector for single-cable (hybrid) solution</b></p> 	<p><b>Screwed encoder connector, EnDat 2.1 or resolver</b></p> 
<p><b>speedtec encoder connector, EnDat 2.1 or resolver</b></p> 	<p><b>I-Tec encoder connector, EnDat 2.2</b></p> 

Table 83: Outer dimensions of connectors

### 4.3.2.3 Cable support

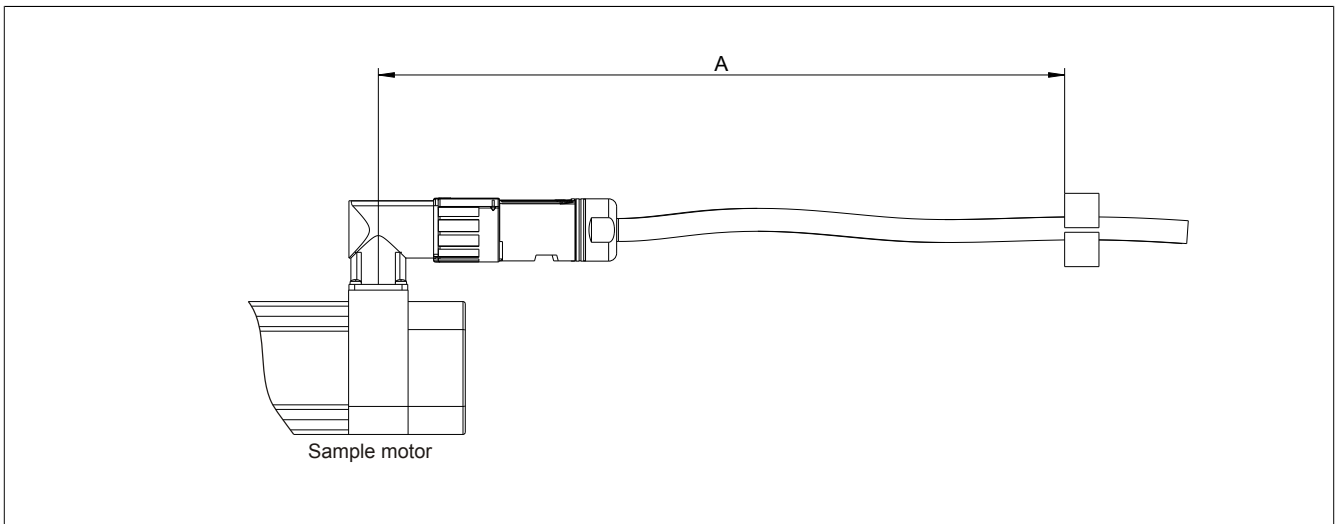


Figure 2: Cable support

- Cable support: A = max. 300 mm along longitudinal axis of connector
- The connection must be free of force and torque
- Movement relative to the connector is not permitted!

For additional technical details and order data for the cables, see the current user's manual for the respective ACOPOS system. These can be found in the Downloads section of our website: [www.br-automation.com](http://www.br-automation.com).

### 4.3.2.4 Using 3rd-party cables

#### Note:

The cable can have a negative effect on voltage overshoots on the winding. If non-B&R cables are used, documented evidence of conformity with voltage class A in accordance with EN 60034-25 must be provided. Without documented evidence, no claim for warranty is possible for winding damage resulting from voltage overshoots on the winding.

### 4.3.2.5 Ensure proper connections

#### Caution!

The connectors must be connected and fastened correctly. Misalignment and subsequent pulling can cause disturbances and damage to the servo motor!

#### Information:

Using B&R connectors guarantees that the EMC limits for the connection are not exceeded. Make sure that connectors are assembled correctly and include a proper shield connection.

## 5 Commissioning and operation

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### 5.1 General

#### Note:

- Commissioning is to be performed exclusively by qualified personnel.
- This must be done in accordance with the commissioning guidelines for the servo drive.

### 5.2 Safety guidelines

#### 5.2.1 Danger of death by electrical shock

#### Warning!

- The servo motor must be disconnected from the mains and free of voltage..
- Connections to the motor must never be disconnected during operation.
- The motor must be free of current and voltage before connecting measuring instruments.
- Before working on motor connections, it must be ensured that they are free of potential and voltage.
- During operation, there is electrical potential at the motor contacts and motor windings. Touching these components during operation is not permitted.

#### 5.2.2 Danger through contact

#### Warning!

- Before touching the servo motor, ensure that it is at a standstill and prevented from being switched back on.
- Only touch the output shaft when the power is off and the motor is at a standstill. Dangerous rotating parts!
- Burn hazard! Never touch the motor housing during normal operation. Surface temperatures on the motor can exceed 100°C.

#### 5.2.3 Working on the servo motor

#### Warning!

Working on the servo motor:

- Working on the servo motor is only permitted when the motor is at a standstill, free of voltage and cooled down.
- Before resuming operation, be sure to replace any screws or other parts that were removed.
- While working on the servo motor, be sure to observe the technical notes in the respective sections of this manual.
- The holding brake does not provide a protective function while working on the motor! (e.g. suspension of loads)

#### 5.2.4 Not a working brake

#### Warning!

The holding brake is not intended for normal braking. The holding brake does not provide protection for personnel. The maximum motor torque far exceeds the holding torque for the brake.

## 5.2.5 Installing and removing safety features

### Danger!

- Operation of the servo motor without its safety features is not permitted.
- If you remove components and/or systems designed to monitor safe operation of the motor, the motor must be switched off.

## 5.3 Verification

### 5.3.1 To verify before commissioning

- The drive is not damaged and is not in a hazardous area created by other equipment.
- The servo motor is properly aligned and secured.
- Screws are tightened properly.
- Any unused connection threads on the flanged end shield are sealed.
- All the necessary protective equipment (mechanical, thermal, electrical) is installed.
- The motor connectors are connected properly.
- The protective ground conductor is installed properly and verified.
- There are no cables or wires touching the surface of the motor.
- The drive is free (release brake).
- E-stop functions have been verified.
- Any fans are connected properly and their functionality has been verified.

### 5.3.2 To verify during commissioning

#### Verify that:

- The functionality of all the motor's components, including encoder, brake, cooling, etc. has been verified.
- The operational conditions are met.
- The brake, if present, is released.
- All electrical attachments and connections are properly implemented and secured.
- All protective measures have been implemented and function tested in order to prevent contact with parts carrying voltage, hot surfaces and rotating or moving parts and assemblies.
- All output elements have been installed and set up in accordance with the manufacturer's specifications.
- Measures are in place to ensure that the maximum permissible speed  $n_{\max}$  of the motor cannot be exceeded. The maximum permissible speed  $n_q$  is the maximum speed that is permissible for short-time duty.

### 5.3.3 To verify during operation

- Listen for unusual sounds.
- If you notice any scraping, scratching or grinding sounds, immediately switch off the drive and determine the cause.
- Check the motor surface and connection lines for dust, oil, moisture, leaks, etc.
- Check the maintenance intervals.
- Check air intake and exhaust openings for dirt and grime.

## 5.4 Faults during operation

### Safety guidelines

#### Warning!

- Only qualified personnel should attempt to localize and correct any errors that occur.
- Do not disable protective equipment – even during trial operation.
- Disconnect and reconnect connection lines only when in a voltage-free, secured state.
- Avoid contact with hot surfaces!

#### General guidelines in the event of faults during operation:

- Consult the operating instructions for the machine/system.
- Consult the operating instructions for the ACOPOS system.
- If necessary, contact the manufacturer.

#### Have the following information at hand:

- Order code and serial number (see type plate)
- Type and extent of fault
- Circumstances under which the fault occurred
- Application data (cycle of torque, speed and forces over time, environmental conditions)

#### Fault table

Fault	Possible cause	Remedy
Motor will not start	Controller enable missing	Activate controller enable
	Controller error, encoder error	Read error log on inverter/controller, correct error
	Power supply not present	Check connection and power supply
	Rotating field	Check phase sequence, replace connection line if necessary
	Brake will not release	Check triggering, connections and power supply
Runs noisily	Brake defective	Contact manufacturer for repair
	Insufficient shielding in connection lines	Check shielding connection and grounding
Vibrations	Controller parameters too high	Optimize controller parameters
	Coupling element or machine not properly balanced	Adjust balance
	Power transmission system misaligned	Realign power transmission system
Noise during operation	Mounting screws loose	Check and tighten screw connections
	Foreign bodies in the motor	Contact manufacturer for repair
Motor gets too warm - motor temperature monitoring triggered	Bearing damage	Contact manufacturer for repair
	Power transmission system overloaded	Check motor load and compare with data on type plate
	Brake not releasing sufficiently, causing friction	Contact manufacturer for repair
Current consumption too high - motor torque too low	Rest angle is incorrect	Check rest angle and adjust as needed

Table 84: Fault table



## 6 Inspection and maintenance

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### Warning!

When performing maintenance, observe the same safety guidelines that apply when commissioning the motor. (see chapter "Commissioning and operation")

### Warning!

Over time, exposure to moisture and contamination can reduce the braking torque. The application should therefore check the braking torque from time to time using the brake test function with the safety factor required for the application. If the brake is no longer achieving the necessary torque, a refresh cycle can help it achieve the necessary torque again. During a refresh cycle, the motor is allowed to turn one revolution at a speed of 50 rpm with the brake engaged. This cleans the brake pads and generally helps the brake to once again achieve the torque it needs. After the refresh cycle, the brake should be tested again. If the brake is still not achieving the necessary torque after 5 refresh cycles, the motor must be replaced.

### 6.1 Inspection

- Cleaning should be performed regularly according to the rate at which dirt accumulates (to ensure sufficient heat dissipation).
- Enable the brake test function in the ACOPOS system if necessary

### 6.2 Maintenance

Various operating conditions (e.g. operating mode, temperature, speed, load, mounting orientation), can have a significant impact on the service life of lubricants, seals and bearings.

If operating normally with no faults, we recommend the following general guidelines for maintenance:

- Replace bearings after approximately 20,000 hours of operation (calculation of bearing service life  $L_{n10}$ : 20,000 operating hours).

If an optional brake is installed, it should be replaced when it reaches its wear limit.

These maintenance tasks are to be performed by B&R itself or by an external specialist commissioned by B&R.

The following maintenance tasks are the responsibility of the operator:

- Cleaning motor surfaces and air ducts
- Checking cables and connectors for damage

# 7 Disposal

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## 7.1 National and local regulations

**Note:**

The motor must be disposed of and/or recycled in accordance with applicable national and local regulations. Encoder electronics must be appropriately disposed of as electronic waste.

## 7.2 Rare-earth magnets

**Caution!**

B&R servo motors contain rare-earth magnets with increased density of magnetic energy!

## 7.3 Magnetized rotor

**Warning!**

A magnetized rotor must never be transported or delivered outside the stator!